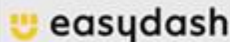
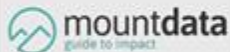


A big thank you to our amazing partners



Thanks

# ✦ Power BI Capacity Unleashed

Information, Insights & Best Practices

---





# Welkom!



**Martijn Giltay**

Software engineer  
webdashboard



**Niki de Leeuw**

Business intelligence specialist  
webdashboard



Deel rapportages eenvoudig en overal!



# Introductie

---

Sinds 2017 bouwen we een product dat volledig draait op capaciteit. Onze ervaring met bursting, smoothing, carry forward en overages maakt ons experts in efficiënt capaciteitbeheer. We zorgen voor optimale prestaties, minimale downtime en slimme schaalbaarheid.





# Agenda

01

## Power BI licenties

Welke licentie modellen biedt Microsoft?

02

## Verschillende capaciteiten

F2, A1, A4, F8, AAAAA (help)

03

## Onze kennis over capaciteit

Product sinds 2017

04

## Hoe werkt capaciteit?

Wat is een CU, hoe verbruik ik CU's?

05

## Hoe krijg je inzicht?

Hoe zie ik wat CU's verbruikt en hoeveel?

06

## Hoe optimaliseer ik capaciteit

Best practices



# 01

## Power BI licenties

Welke licentie modellen biedt Microsoft?

---



Deel rapportages eenvoudig en overal!





# Power BI licenties

## Pay for users

## Pay for usage

### PRO

Data verversingen per dag 8x

Geheugen model  
limiet 1 GB

€ 9,40 -> € 13,16  
pu/pm

### PREMIUM

Data verversingen  
per dag 48x

Geheugen model  
limiet 100 GB

€ 18,70 -> € 22,44  
pu/pm

### FABRIC Capacity

Pro licenties  
nodig voor delen tot  
F64

Iedereen moet in  
jouw tenant zijn  
(evt. als gast)

Vanaf € 183,30 p/m  
F64 - € 5865,64 p/m

### Power BI Capacity

Delen zonder Pro  
licenties (custom  
development)

Geen toegang tot  
app.powerbi.com

Vanaf € 706,25 p/m



# 02

## Verschillende capaciteiten

Welke capaciteit licenties zijn er?

---




Deel rapportages eenvoudig en overal!





# Capaciteiten

	A (Embedded)	F (Fabric)	P (premium)
Instap SKU	A1	F2	
Capacity Units (CU)	8	2	
Gebruik	Power bi onderdelen	Datawarehousing	
Prijs p/m	€ 706,25	€ 308,25 - € 183,30*	



Prijs F8 met 8 CU's € 1233,01 - € 733,21\*

\* Gereserveerd voor 1 jaar.



# 03

## Onze kennis over capaciteit

Product sinds 2017

---





# Product bouw!

## Pay for users

### PRO

Data verversingen per dag 8x

Geheugen model limiet 1 GB

€ 9,40 -> € 13,16  
pu/pm

### PREMIUM

Data verversingen per dag 48x

Geheugen model limiet 100 GB

€ 18,70 -> € 22,44  
pu/pm

## Pay for usage

### FABRIC Capacity

Pro licenties nodig voor delen tot F64

Iedereen moet in jouw tenant zijn (gasten)

Vanaf € 183,30 p/m  
F64 - € 5865,64 p/m

### Power BI Capacity

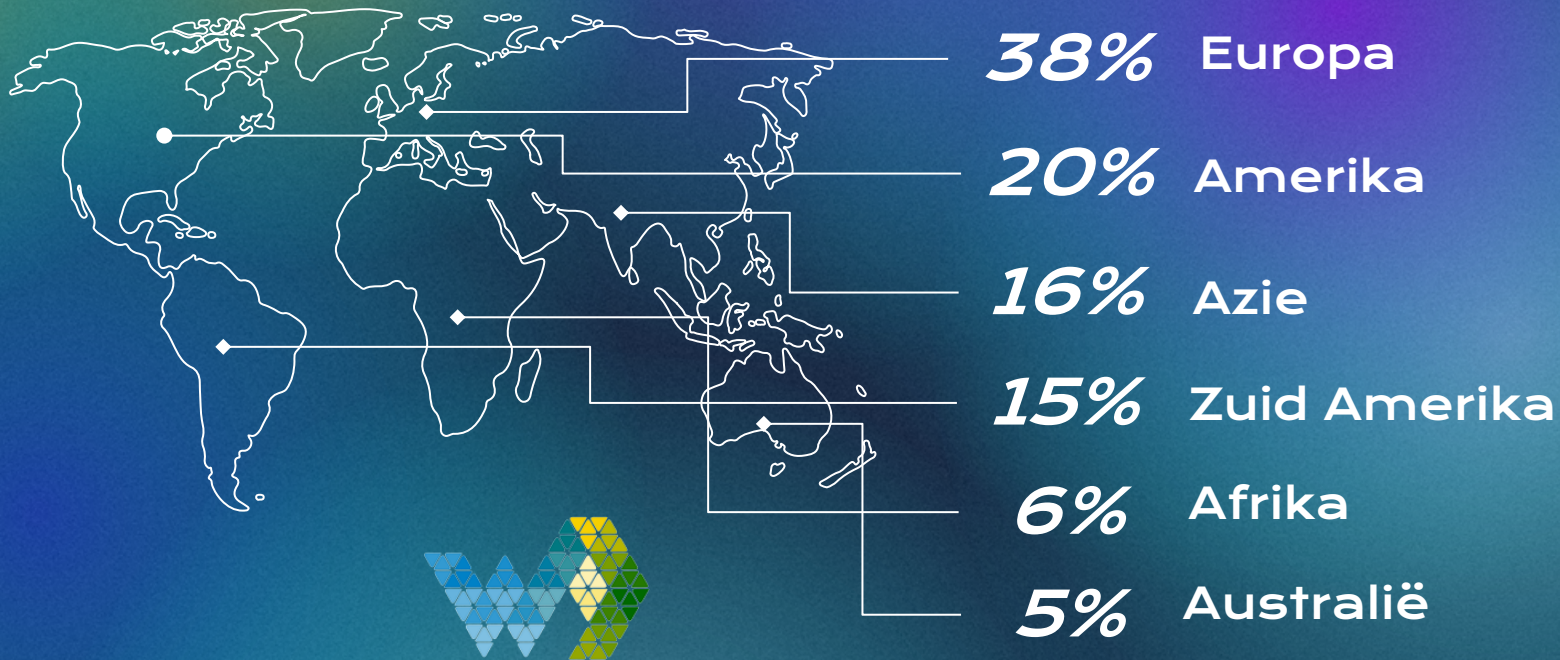
Delen zonder Pro licenties (custom development)

Geen toegang tot app.powerbi.com

Vanaf € 706,25 p/m



# 5000+ Rapportages



 Deel rapportages eenvoudig en overal!





# 04

## Hoe werkt capaciteit?

Wat is een CU, hoe verbruik ik CU's?

---



# Rekenkracht

Capacity unites (CU's) = Rekenkracht

Capaciteitseenheden (CU's) zijn meeteenheden die een verzameling rekenkracht vertegenwoordigen.

Rekenkracht is nodig om queries, taken of opdrachten uit te voeren.



F64 – 64 CU



A4 – 64 CU



64 CU  
betekent 64  
CU's per  
seconde

$64 * 3600 * 24 = 5.529.600$  CU's per dag

$5.529.600 * 14 = 77.414.400$  CU's per 14 dagen





# Hoe verbruik ik CU's

## Interactief



- Gebruikers UI
- Rapportages renderen
- Dataflow direct query
- Queries
- XLMA read (door gebruiker)

**CU -> 5 MIN**

## Achtergrond



- Semantic model refresh (on-demand)
- PBI Dataflow Refresh
- Report Export (pdf)
- XLMA write (taak die het model aanpast)



- Onelake
- Datawarehousing
- Co-pilot
- Notebooks

**CU -> 24 UUR**



# CU verbruik in de praktijk

## Bursting

Tijdelijk meer capaciteit verbruiken dan normaal is toegewezen.

## Smoothing

Smoothing biedt verlichting voor pieken

## Carry forward

het systeem staat toe om tot 10 minuten aan extra capaciteit te lenen voordat throttling (vertraging) begint.

## Overages

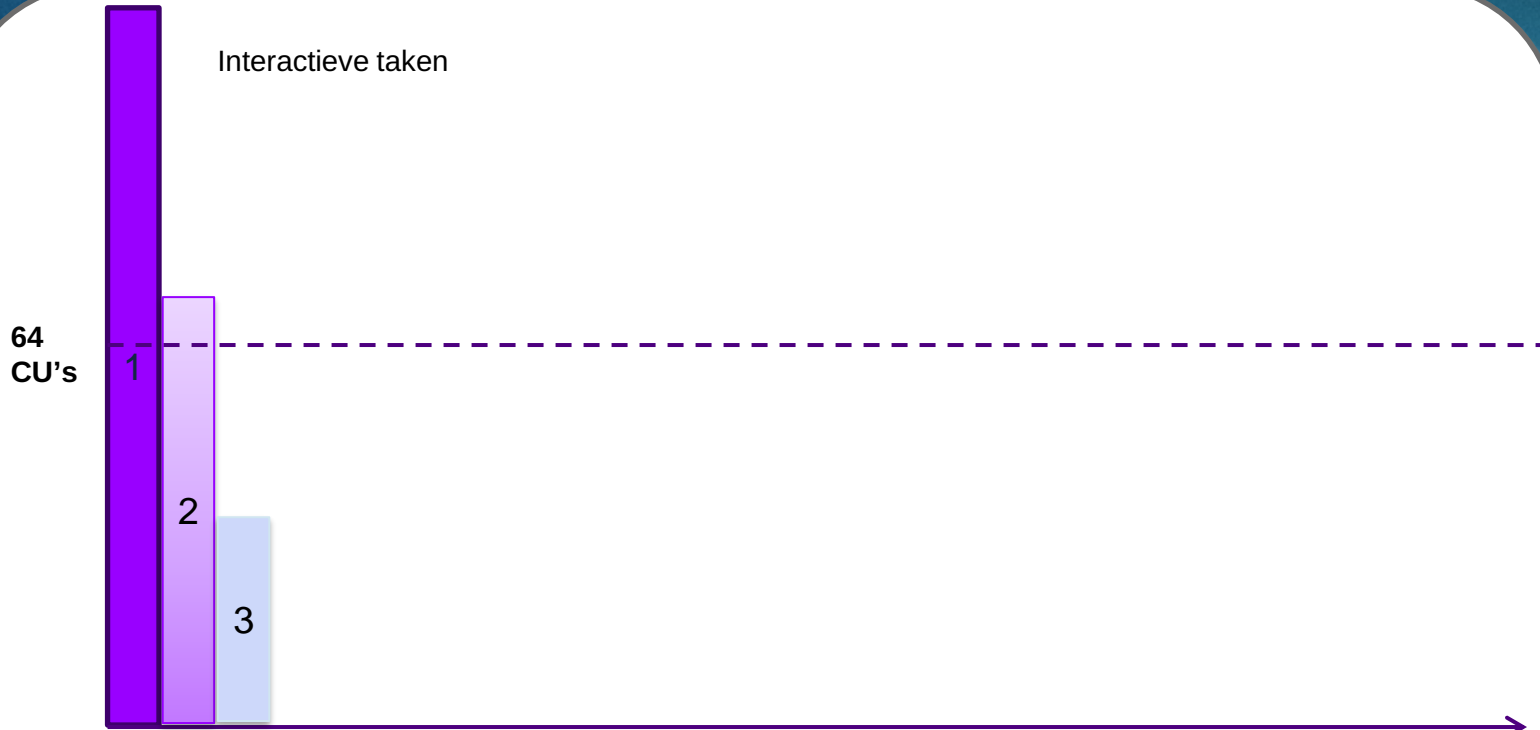
Waarschuwingen zullen worden gegeven en uiteindelijk zullen taken worden afgebroken





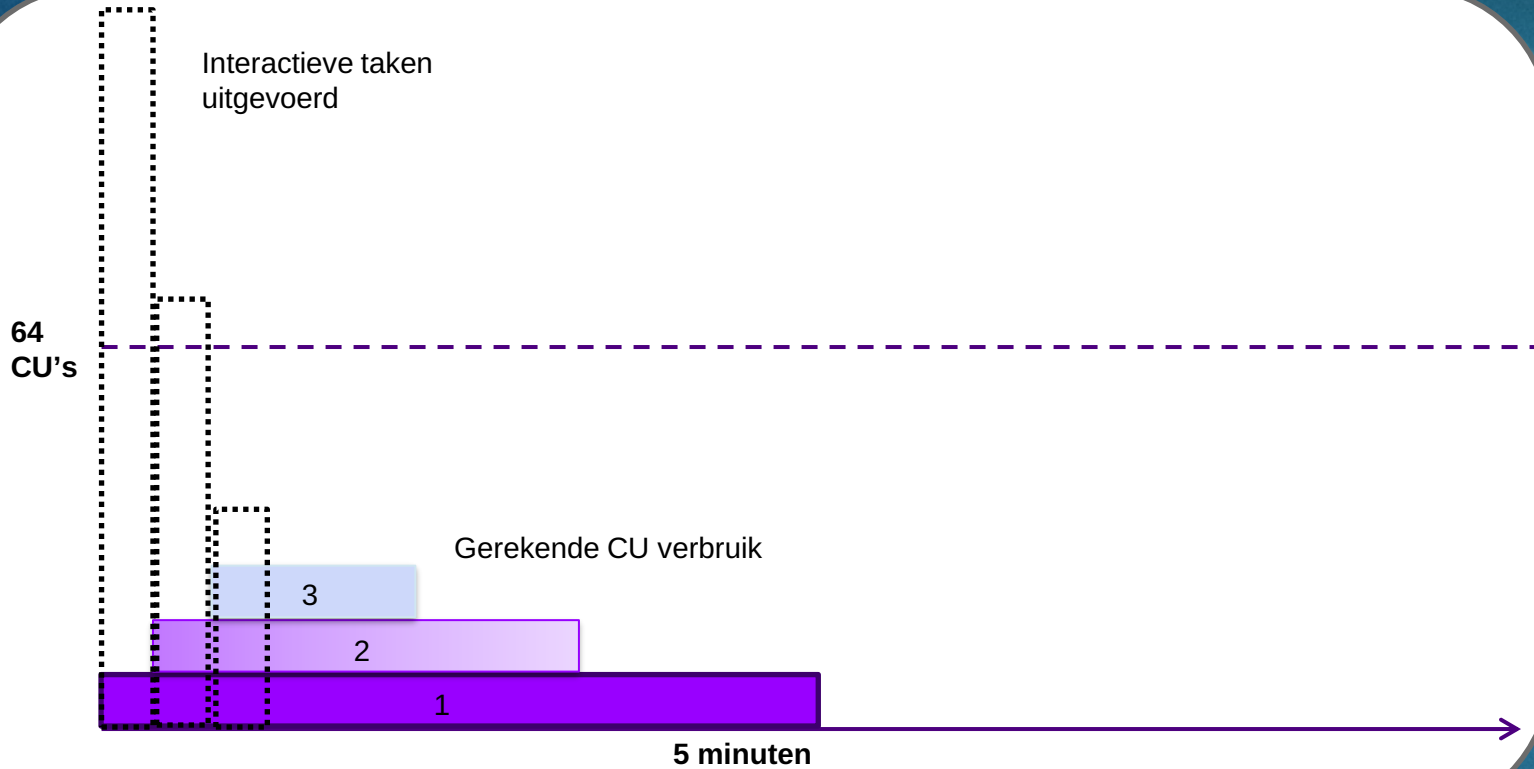
# Bursting

interactief



# Smoothing

interactief



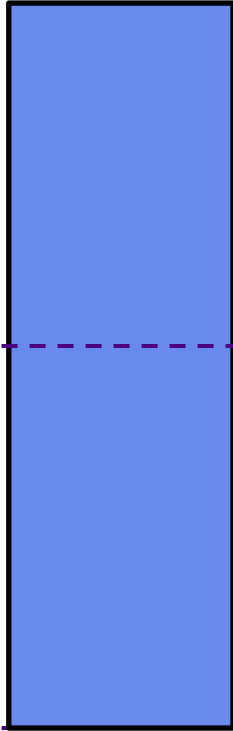


# Bursting

## Achtergrond

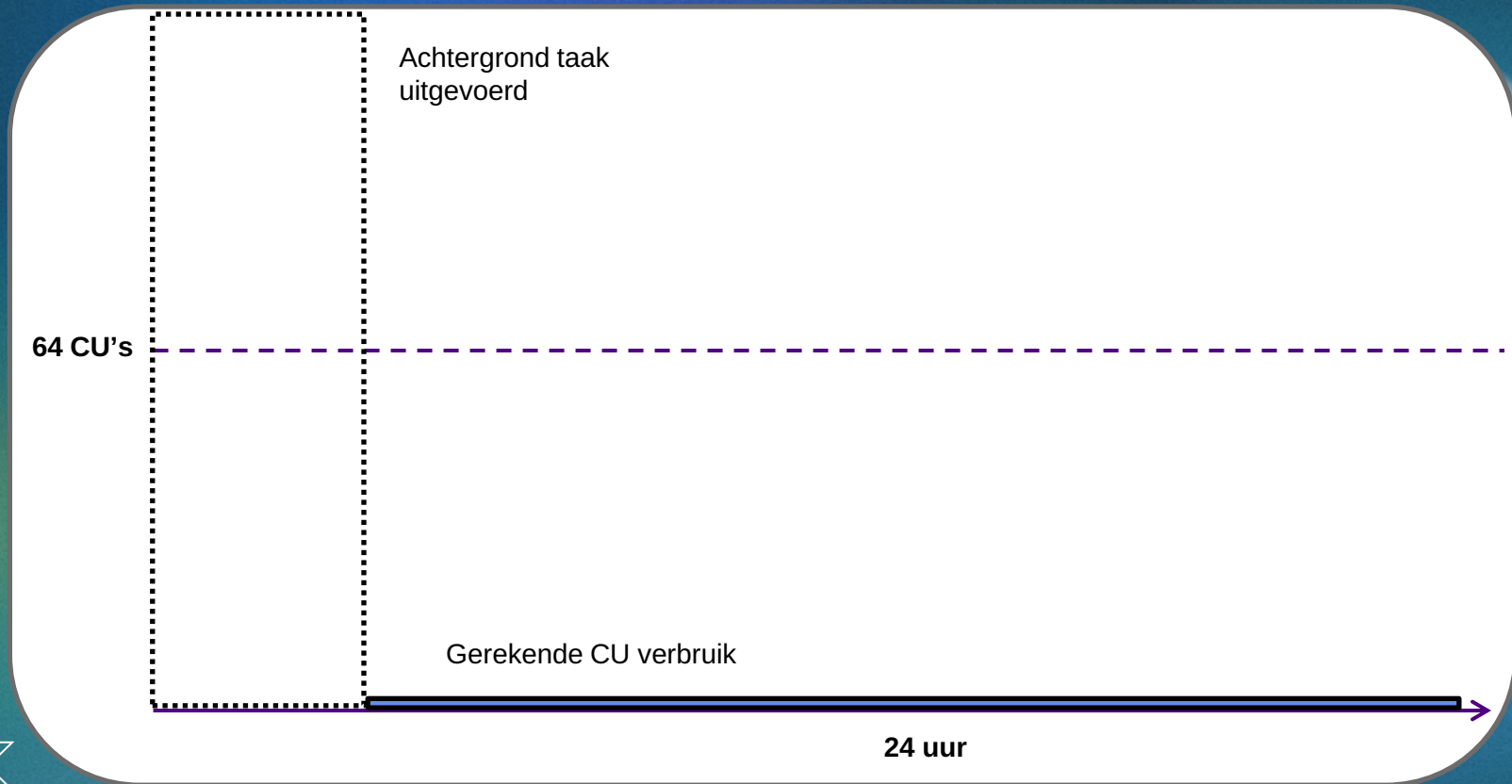
Achtergrond taak

64 CU's



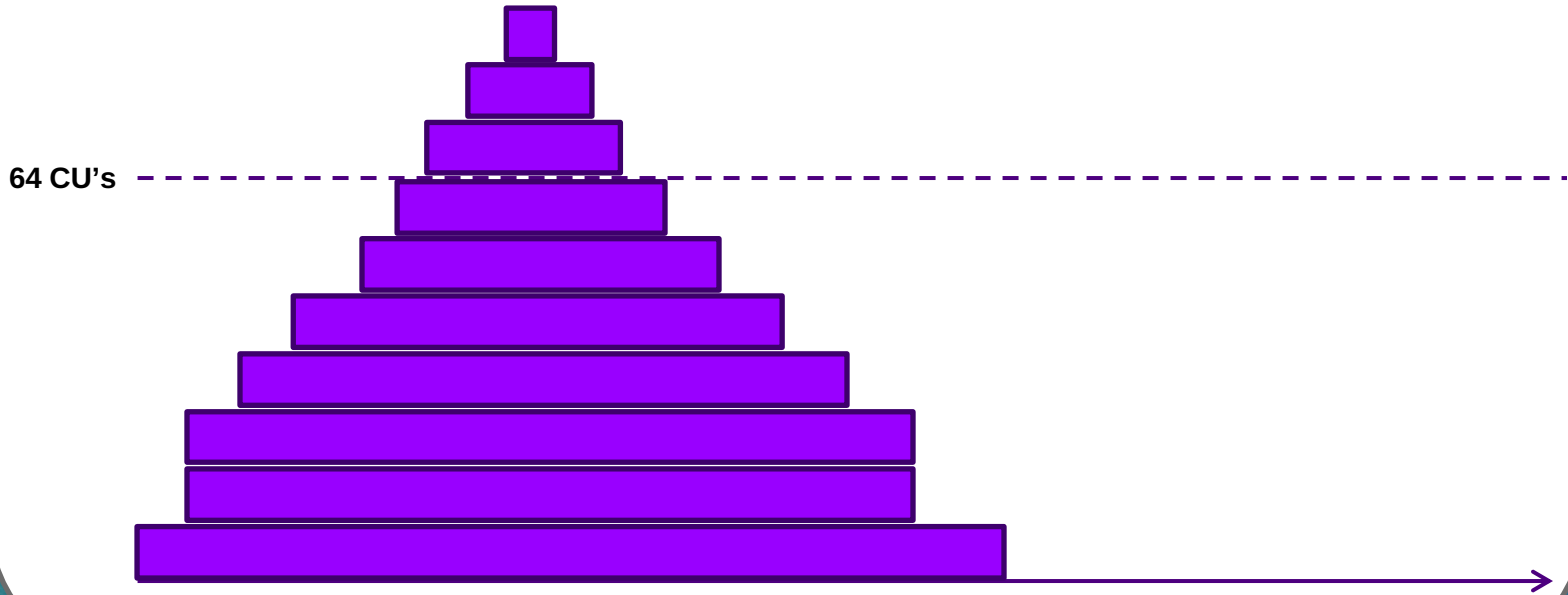
# Smoothing

## Achtergrond





# Carry forward

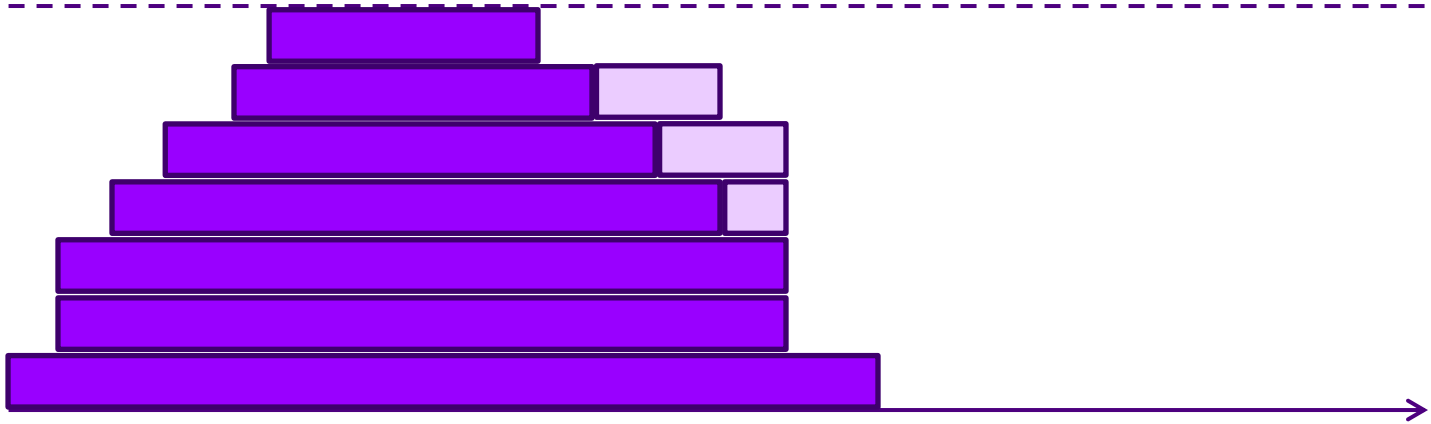


# Carry forward

het systeem staat toe  
om tot **10** minuten aan  
extra capaciteit te  
lenen

$$10 * 60 * 64 = 38400 \text{ CU's}$$

64 CU's





# Overages



## Waarschuwingen

Emails naar ingestelde gebruikers dat je de limieten bijna of al aan het overschrijden bent.

(90%)



## Over het limiet heen

gebruik  $\leq$  10 minuten

**Carry Forward**

10 minuten  $<$  gebruik  $\leq$  60 minuten

**Interactieve vertraging**

60 minuten  $<$  gebruik  $\leq$  24 uur

**interactieve taken geweigerd**

gebruik  $>$  24 uur

**Alle taken geweigerd**



## Oplossing

- Wachten
- Interactief gebruik verlagen
- Capaciteit vergroten
- Pauzeren



# 05

## Hoe krijg je inzicht?

Hoe zie ik wat CU's verbruikt en hoeveel?

---





# Inzicht in capaciteit verbruik




## Inzicht




## Webdashboard Performance

*How do my datasets perform?*



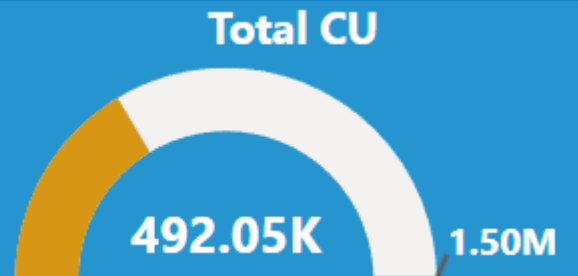
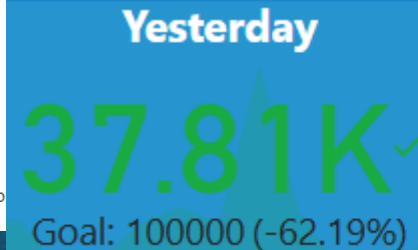
### Microsoft Fabric Capacity M

by Microsoft

 Power BI apps

★ 3.0 (44 ratings)

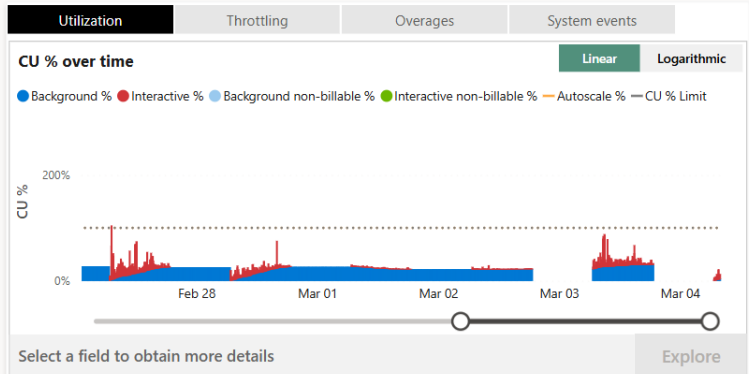
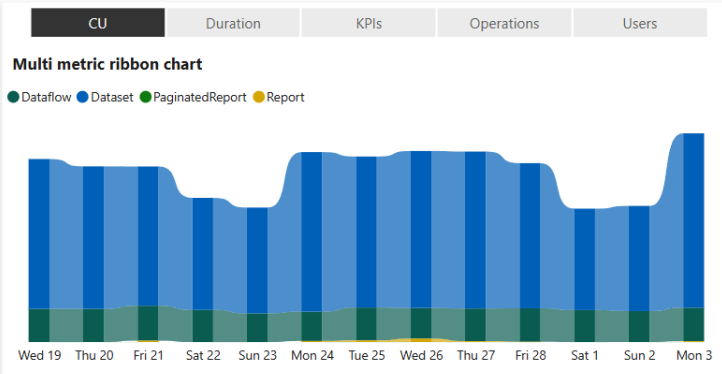
Pricing **Free** [Get it now](#) ☆ Save to





Capacity name:

Pick a capacity from the Capacity name slicer to see data. All visuals on the page will refresh each time a capacity is picked. Learn how to use this page by clicking the "info" button.



Select item kind(s):  All  Select optional column(s):  Rejected count

Items (14 days)

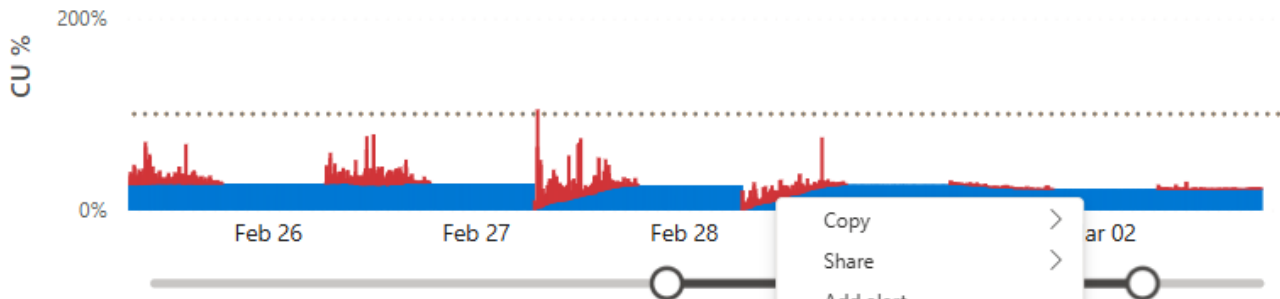
Workspace	Item kind	Item name	CU (s)	Duration (s)	Users	Rejected count	Billing type
MicrosoftFabricCapacityMetrics	Dataset	Fabric Capacity Metrics	22,759.4720	4,844.0880	2	0	Billable
	Dataset		387.8880	42.8330	9	0	Billable
	Dataset		25,133.7920	1,455.7810	20	0	Billable
	Dataset		195.2640	17.8700	2	0	Billable
	Dataset		101.3440	14.7280	2	0	Billable
	Dataset		5,152.7200	730.5810	2	0	Billable
	Dataset		3,337.6640	189.7820	2	0	Billable
	Dataset		4,092.1280	395.2530	2	0	Billable
	Dataset		1,659.1040	130.4810	3	0	Billable
	Dataset		78.2880	6.4150	2	0	Billable
	Dataset		83.7440	8.4190	2	0	Billable
	Dataset		5,810.1440	299.3800	2	0	Billable
	Dataset		2,132.4960	93.8420	2	0	Billable
	Dataset		2,988.0480	280.0200	2	0	Billable
<b>Total</b>			<b>10,285,234.7920</b>	<b>1,617,668.9280</b>	<b>29</b>	<b>0</b>	





## CU % over time

● Background % ● Interactive % ● Background non-billable % ● Interactive non-billable % — Autoscale % — CU % Limit



Select a field to obtain more details

- Copy >
  - Share >
  - Add alert
  - Show as a table
  - Include
  - Exclude
  - ⌕ Drill through >
- TimePoint Detail

Explore



# Fabric Capacity Metrics

Start : 3/2/2025 8:25:00 AM

End : 3/2/2025 8:25:30 AM



<b>300</b> Interactive operations	<b>570</b> Background operations	<b>A3</b> SKU	<b>960</b> CU (s)
--------------------------------------	-------------------------------------	------------------	----------------------

## Interactive operations for timerange

Select optional column(s): Billing type

Workspace	Item kind	Item name	Operation	Start	End	Status	User	Duration (s)	Total CU (s)	Timepoint CU (s)	Throttling (s)	% of Base c
	Dataset		Query	3/2/2025 8:20:14 ...	3/2/2025 8:20:14 ...	Success		0	0.5120	0.0512	0	
	Dataset		Query	3/2/2025 8:20:15 ...	3/2/2025 8:20:15 ...	Success		0	3.5680	0.3568	0	
	Dataset		Query	3/2/2025 8:20:25 ...	3/2/2025 8:20:25 ...	Success		0	1.0080	0.1008	0	
	Dataset		Query	3/2/2025 8:20:42 ...	3/2/2025 8:20:42 ...	Success		0	0.7520	0.0752	0	
	Dataset		Query	3/2/2025 8:20:46 ...	3/2/2025 8:20:46 ...	Success		0	3.0560	0.3056	0	
	Dataset		Query	3/2/2025 8:20:56 ...	3/2/2025 8:20:56 ...	Success		0	0.4960	0.0496	0	
	Dataset		Query	3/2/2025 8:21:05 ...	3/2/2025 8:21:05 ...	Success		0	5.3600	0.5360	0	
	Dataset		Query	3/2/2025 8:21:08 ...	3/2/2025 8:21:08 ...	Success		0	1.0080	0.1008	0	
	Dataset		Query	3/2/2025 8:21:13 ...	3/2/2025 8:21:13 ...	Success		0	0.5120	0.0512	0	
<b>Total</b>								<b>0</b>	<b>121.0080</b>	<b>12.1008</b>	<b>0</b>	

## Background operations for timerange

Select optional column(s): Billing type

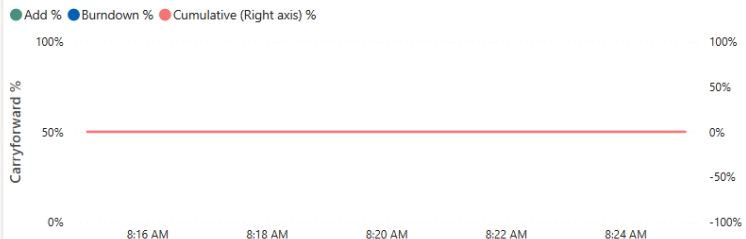
Workspace	Item kind	Item name	Operation	Start	End	Status	User	Duration (s)	Total CU (s)	Timepoint CU (s)	Throttling (s)	% of Base capacity	Billing t
	Dataflow		Dataflow Refresh	3/2/2025 7:34:01 ...	3/2/2025 7:54:39 ...	Success		1,238	24,573.7760	8,5326	0	0.89%	Billable
	Dataflow		Dataflow Refresh	3/2/2025 7:37:01 ...	3/2/2025 7:44:05 ...	Success		424	6,300.4960	2,1877	0	0.23%	Billable
	Dataset		Dataset Schedule...	3/2/2025 7:32:13 ...	3/2/2025 7:33:51 ...	Success		98	5,345.2480	1,8560	0	0.19%	Billable
	Dataset		Dataset Schedule...	3/2/2025 8:04:29 ...	3/2/2025 8:07:28 ...	Success		179	3,890.0000	1,3507	0	0.14%	Billable
	Dataset		Dataset Schedule...	3/2/2025 7:36:06 ...	3/2/2025 7:47:17 ...	Success		671	3,707.0080	1,2872	0	0.13%	Billable
	Dataset		Dataset Schedule...	3/2/2025 7:35:35 ...	3/2/2025 7:36:44 ...	Success		69	3,679.7440	1,2777	0	0.13%	Billable
	Dataflow		Dataflow Refresh	3/2/2025 8:18:01 ...	3/2/2025 8:19:12 ...	Success		71	3,200.9920	1,1115	0	0.12%	Billable
	Dataset		Dataset Schedule...	3/2/2025 7:06:09 ...	3/2/2025 7:18:00 ...	Success		711	3,167.5040	1,0998	0	0.11%	Billable
	Dataset		Dataset Schedule...	3/2/2025 8:04:08 ...	3/2/2025 8:12:48 ...	Success		520	3,064.0000	1,0639	0	0.11%	Billable
<b>Total</b>								<b>15,933</b>	<b>111,025.1...</b>	<b>38,5504</b>	<b>0</b>	<b>4.02%</b>	

## Burndown table for timerange

Experience	Add %	Burndown %	Cumulative %	Minutes to burndown
AS	0.00%	0.00%	0.00%	0.00
CDSA	0.00%	0.00%	0.00%	0.00
RsRdEngine	0.00%	0.00%	0.00%	0.00
<b>Total</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00</b>

## Overages

10 mins 60 mins 24 hrs





# Hoe kies ik de juiste capaciteit?





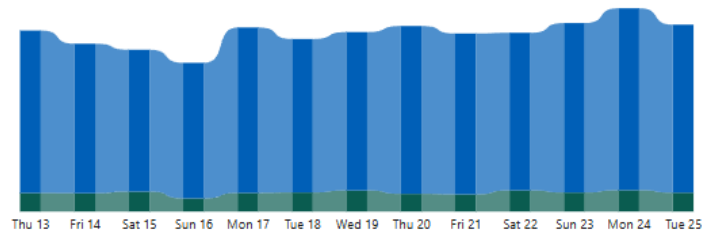
Capacity name:

Pick a capacity from the Capacity name slicer to see data. All visuals on the page will refresh each time a capacity is picked. Learn how to use this page by clicking the "info" button.

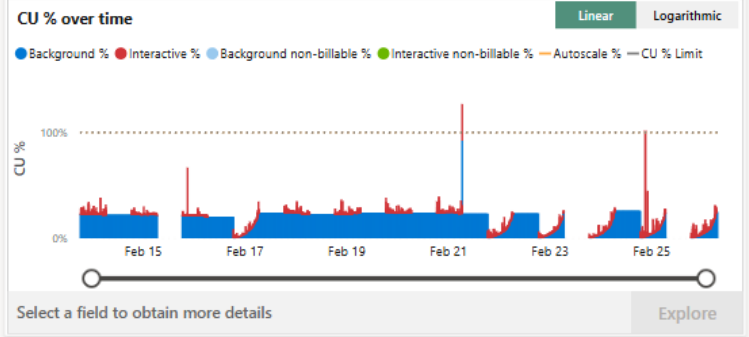
- CU**
- Duration
- Operations
- Users

Multi metric ribbon chart

Dataflow  Dataset



- Utilization**
- Throttling
- Overages
- System events



Select item kind(s):  Multiple selections  Select optional column(s):  Rejected count

Items (14 days)

Workspace	Item kind	Item name	CU (s)	Duration (s)	Users	Rejected count	Billing type
MicrosoftFabricCapacityMetrics	Dataset	Fabric Capacity Metrics	6,013.3440	1,890.6960	2	0	Billable
	Dataset		1,867.5680	632.1820	5	0	Billable
	Dataset		23,844.3520	1,463.7980	8	0	Billable
	Dataset		2,139.2800	175.7620	2	0	Billable
	Dataset		9,619.2160	310.6710	3	0	Billable
	Dataset		13,209.5680	2,510.2890	2	0	Billable
	Dataset		794.7680	20.8580	2	0	Billable
	Dataset		2,975.7440	151.4120	3	0	Billable
	Dataset		3,189.9200	548.6210	2	0	Billable
	Dataset		70.4000	10.5170	2	0	Billable
	Dataset		3.2640	1.3600	2	0	Billable
	Dataset		41.6320	4.5390	2	0	Billable
	Dataset		60.9440	4.7540	2	0	Billable
	Dataset		36.9120	4.2260	2	0	Billable
<b>Total</b>			<b>9,074,397.6640</b>	<b>1,303,265.4650</b>	<b>12</b>	<b>0</b>	



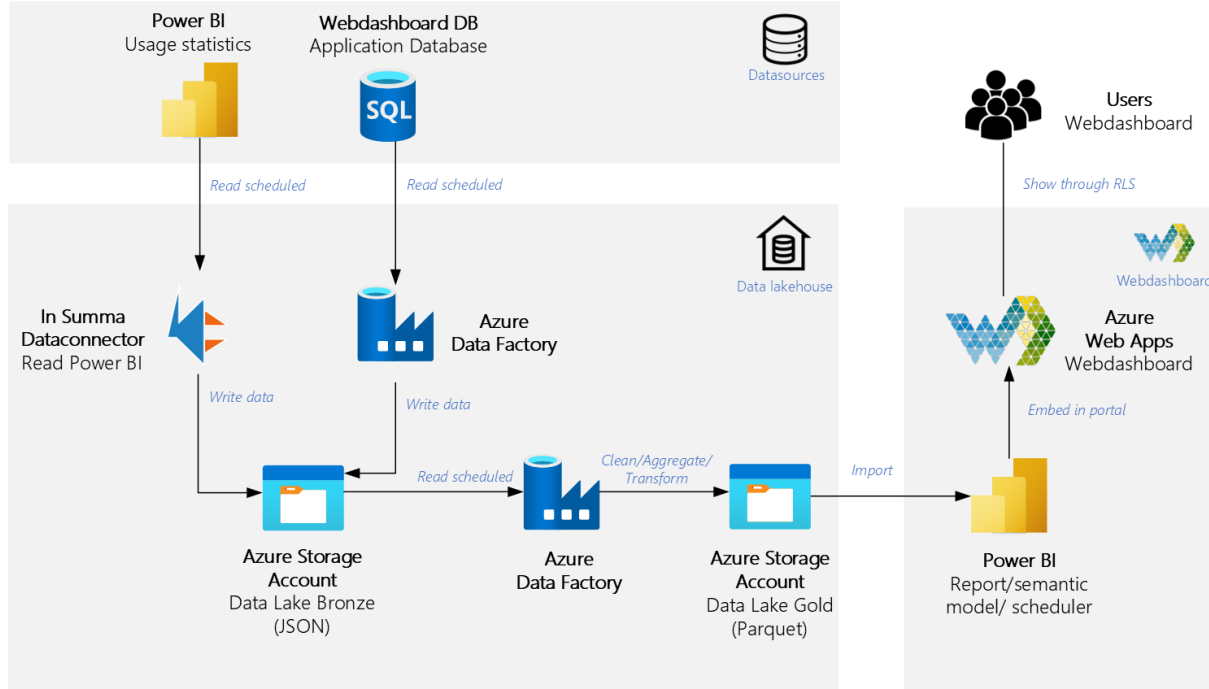
SKU*	(CU s)	SKU	Max (14 days)	70%	Pricing	Reserved
F2	2 -		2419200 CU	1693440 CU	308.25 €	183.30 € ~41% savings
F4	4 -		4838400 CU	3386880 CU	616.51 €	366.60 € ~41% savings
F8	8 EM/A1		9676800 CU	6773760 CU	1,233.01 €	733.21 € ~41% savings
F16	16 EM2/A2		19353600 CU	13547520 CU	2,466.03 €	1,466.41 € ~41% savings
F32	32 EM3/A3		38707200 CU	27095040 CU	4,932.05 €	2,932.82 € ~41% savings
F64	64 A4		77414400 CU	54190080 CU	9,864.11 €	5,865.64 € ~41% savings
F128	128 A5		154828800 CU	108380160 CU	19,728.22 €	11,731.29 € ~41% savings
F256	256 A6		309657600 CU	216760320 CU	39,456.43 €	23,462.57 € ~41% savings
F512	512 A7		619315200 CU	433520640 CU	78,912.86 €	46,925.14 € ~41% savings
F1024	1024 A8		1238630400 CU	867041280 CU	157,825.72 €	93,850.29 € ~41% savings
F2048	2048 -		2477260800 CU	1734082560 CU	315,651.44 €	187,700.58 € ~41% savings



# Hoe hebben onze klanten inzicht op onze capacities

## Webdashboard – Performance overview

A Datawarehouse to show:  
 - Daily updated performance overview  
 - 14 days





# Webdashboard Performance

How do my datasets perform?

Yesterday

37.81K ✓

Goal: 100000 (-62.19%)

Total CU



## Welcome to the Webdashboard Performance report.

This report has been made to give the **admins** of the various portals, insight into the **performance** and the **usage** of their various datasets.

In the header you have a KPI per day and over 14 days to show how you are doing against the fair use policy.

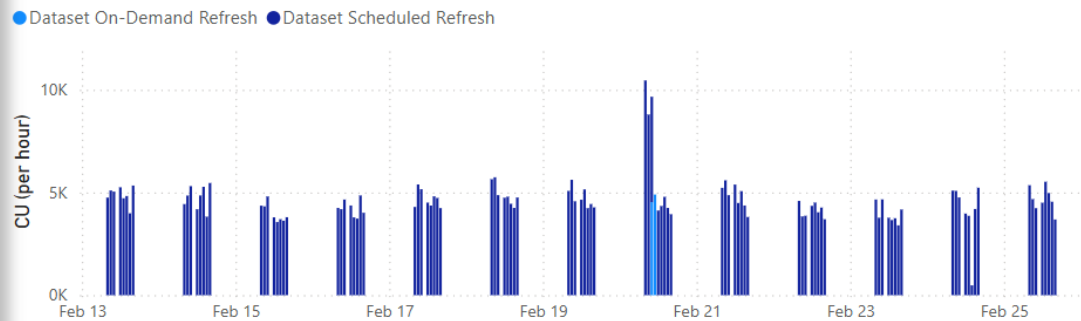
Background and interactive tasks are shown on the right. They are mapped summarized per hour. Drill down on an hour to see what operations were done on what dataset on that specific hour.

If you have any questions, please visit our knowledge or contact support:

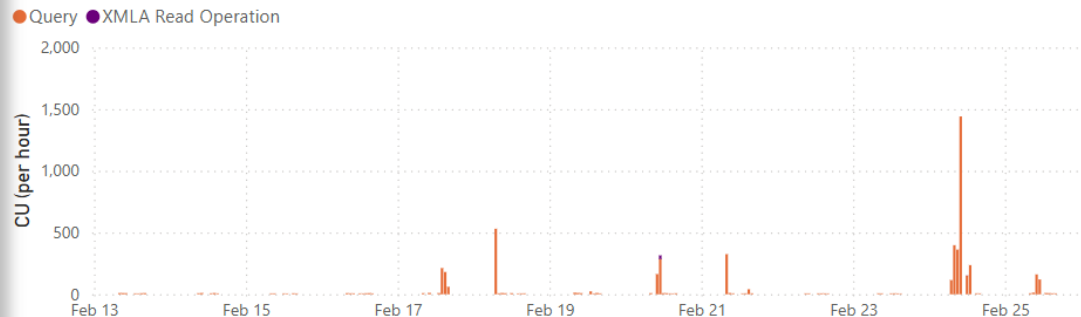
[Knowledge base](#)  
[support@webdashboard.com](mailto:support@webdashboard.com)

Team Webdashboard

### Background tasks



### Interactive tasks



## What's new and planned for Administration, Governance and Security in Microsoft Fabric

### Workspace monitoring

Estimated release timeline: Q4 2024

Release Type: Public preview

Fabric workspace administrators and developers require access to detailed diagnostic logs and workload metrics to troubleshoot performance issues, capacity performance, and data downtime. As part of the Fabric Monitoring feature we intend to provide a read-only database of workspace logs that users can query ad-hoc, analyze for patterns and anomalies, or save drafted queries to as query sets. This helps drive investigations on root-cause analysis for errors, long running queries, refresh failures, and other issues. We will continue to enhance this feature by adding in-context monitoring and diagnostics experiences.





06

Hoe

optimalizeer  
ik capaciteit

Best practices

---



Deel rapportages eenvoudig en overal!



# CU verbruik in de praktijk

## Bursting

Tijdelijk meer capaciteit verbruiken dan normaal is toegewezen.

## Smoothing

Smoothing biedt verlichting voor pieken

## Carry forward

het systeem staat toe om tot 10 minuten aan extra capaciteit te lenen voordat throttling (vertraging) begint.

## Overages

Waarschuwingen zullen worden gegeven en uiteindelijk zullen taken worden afgebroken





# Modelleren in de backend



## Powerquery

Zo min mogelijk gebruiken!

Bouw een gedegen  
Datalakehouse

## Impact bij dataset refresh

Dezelfde data!

Bij modelleren met  
Powerquery



CU verbruik + 40% !!!



# Modelleer in een stermodel



## Snowflake

Door niet goed op te schonen  
en slecht voor te bereiden

Bouw een gedegen  
Datalakehouse

## Impact bij dataset refresh

Dezelfde data!

Bij een snowflake model



CU verbruik + 20% !!!





# Vershil in preformance

## Background operations for timerange

Select optional column(s):

 Billing type      

Item kind	Item name	Operation	Start	End	Status	User	Duration (s)	Total CU (s)	Timepoint CU (s)	Thrott
Dataset	AdventureWorksBadPracticeDataset	Dataset On-Demand Refresh	2/26/2025 9:19:36 PM	2/26/2025 9:19:4...	Success	DemoPortaal@wdbportal.com	10	381.7440	0.1326	
Dataset	AdventureWorksBadPracticeDataset_SF	Dataset On-Demand Refresh	2/26/2025 9:19:34 PM	2/26/2025 9:19:4...	Success	DemoPortaal@wdbportal.com	10	330.4960	0.1148	
Dataset	AdventureWorksBestPracticeDataset	Dataset On-Demand Refresh	2/26/2025 9:19:30 PM	2/26/2025 9:19:3...	Success	DemoPortaal@wdbportal.com	8	273.2480	0.0949	
							<b>28</b>	<b>985.4880</b>	<b>0.3422</b>	

$$\frac{381 - 273}{273} \times 100\% = \frac{108}{273} \times 100\% \approx 39.56\%$$

$$\frac{330 - 273}{273} \times 100\% = \frac{57}{273} \times 100\% \approx 20.88\%$$



# Geen excel nabouwen



## Grote tabellen en matrixen

Matrixen met veel kolommen, rijen en measures

Dit heeft impact op je interactieve CU usage (per 5 min)

Impact bij klikken



CU Verbruik Matrix

+ 466% !!!





# Geen excel nabouwen



Grote tabellen en matrixen

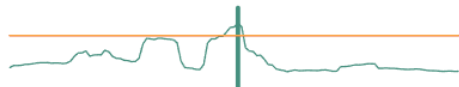
CU verbruik in 12 klikken  
**100+% !!!**

Start : 1/15/2025 10:13:00 AM

End : 1/15/2025 10:13:30 AM

CU % Limit

CU %



1875

Interactive operations

1194

Background operations

A3

SKU

960

CU (s)

## Interactive operations for timerange

Select optional column(s): Billing type

Workspace	Item kind	Item name	Operation	Start	End	Status	User	Duration (s)	Total CU (s)	Timepoint CU (s)	Throttling (s)	% of Base capacity	Billing type
	Dataset		Query	1/15/2025 10:08:2...	1/15/2025 10:08:4...	Success	Power BI Service	20	892.0000	89.2000	0	9.29%	Billable
	Dataset		Query	1/15/2025 10:08:3...	1/15/2025 10:08:4...	Success	Power BI Service	17	759.0080	75.9008	0	7.91%	Billable
	Dataset		Query	1/15/2025 10:11:1...	1/15/2025 10:11:2...	Success	Power BI Service	12	740.0000	74.0000	0	7.71%	Billable
	Dataset		Query	1/15/2025 10:12:1...	1/15/2025 10:12:3...	Success	Power BI Service	16	733.5040	73.3504	0	7.64%	Billable
	Dataset		Query	1/15/2025 10:10:5...	1/15/2025 10:11:0...	Success	Power BI Service	11	714.4960	71.4496	0	7.44%	Billable
	Dataset		Query	1/15/2025 10:08:4...	1/15/2025 10:08:5...	Success	Power BI Service	10	670.0000	67.0000	0	6.98%	Billable
	Dataset		Query	1/15/2025 10:10:0...	1/15/2025 10:10:1...	Success	Power BI Service	11	669.2480	66.9248	0	6.97%	Billable
	Dataset		Query	1/15/2025 10:08:2...	1/15/2025 10:08:4...	Success	Power BI Service	15	666.2560	66.6256	0	6.94%	Billable
	Dataset		Query	1/15/2025 10:08:1...	1/15/2025 10:08:3...	Success	Power BI Service	11	654.0000	65.4000	0	6.81%	Billable
	Dataset		Query	1/15/2025 10:08:3...	1/15/2025 10:08:4...	Success	Power BI Service	12	654.0000	65.4000	0	6.81%	Billable
<b>Total</b>								<b>266</b>	<b>9,610.9760</b>	<b>961.0976</b>	<b>0</b>	<b>100.11%</b>	



Deel rapportages eenvoudig en overal!



Webdashboard empowers you to unleash the full potential of Power BI Capacity — turning scalability into possibility and insights into impact.

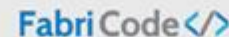
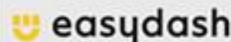
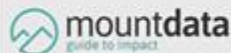
20  
XX

Deel rapportages eenvoudig en overal!





# A big thank you to our amazing partners



Thanks

# Session Feedback



# Event Feedback

