

The Alan Turing Institute

RCTab Cloud Subscription Management System

FOSDEM'24 – HPC, Big Data & Data Science Devroom

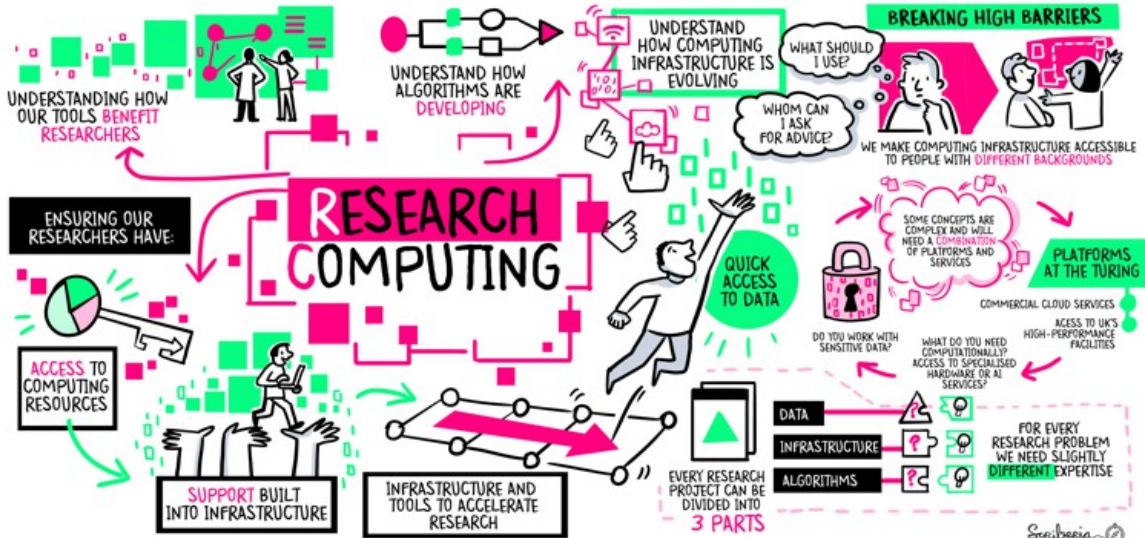
David Llewellyn-Jones

3rd February 2024



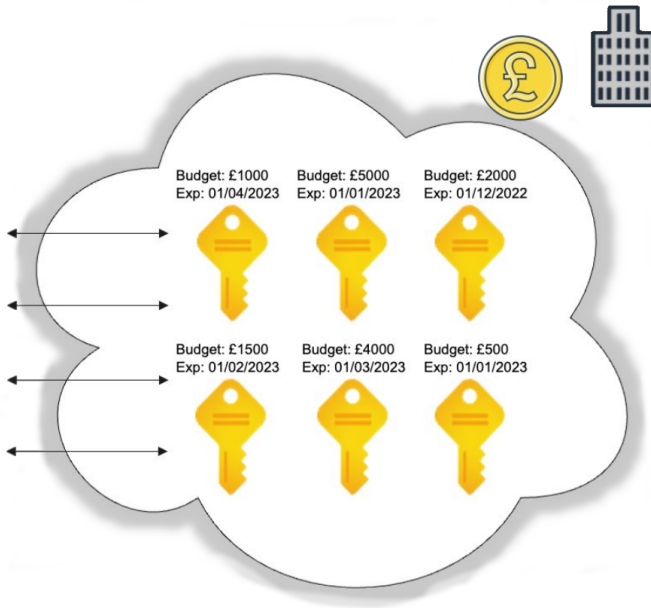
About the Team

1. Research Computing Platforms
2. Currently: Tomas Lazauskas, Iain Stenson, Eise Ben, Joe Palmer, David Llewellyn-Jones
3. Previously: Oscar T Giles, Pam Wochner



The Cloud

1. Why is Cloud useful in research?
2. Users want access but costs can escalate fast
3. Cloud is moving into the HPC space
4. Attractive to users without a Linux background



[Home](#) > [Subscriptions](#) >

Subscriptions

The Alan Turing Institute (turing.ac.uk)

[+ Add](#) [Advanced options](#) Subscriptions : **Filtered (84 of 84)**

My role == all

Status == all

[+ Add filter](#)

Subscription name	Subscription ID	My role	Current cost
RCTab	ea2d03d4-89de-4f3c-a039-4a2229094b4b	Account admin	£135.92
Research Compute Platforms	78e8b55d-ce3a-4d5f-8139-d256ffe10aa6	Account admin	£284.21
Reservations	2688aedef-6eb3-4527-ab3f-cc778450d804	Account admin	0.00
		Account admin	£3.59
		Account admin	0.00
		Account admin	£96.01

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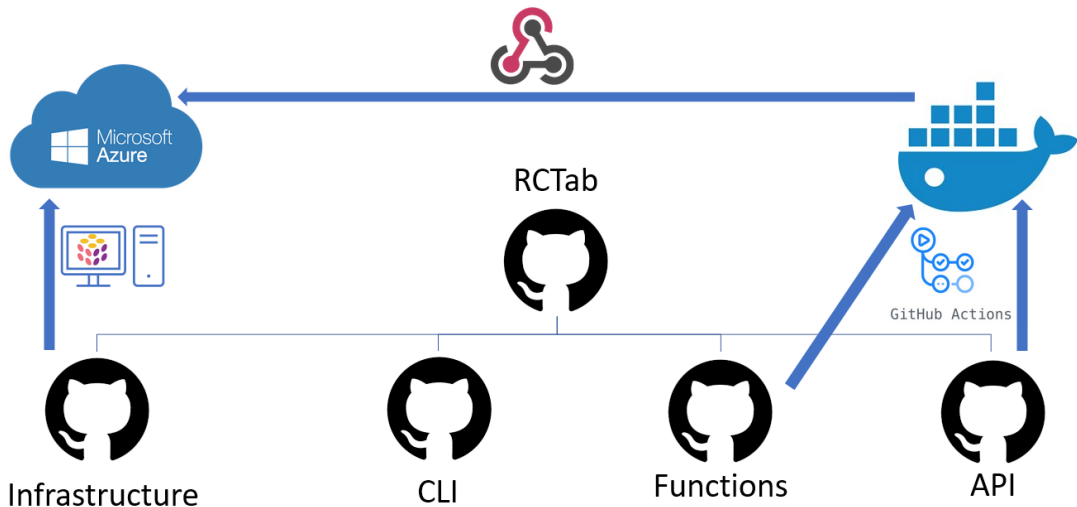
Showing 1 to 24 of 84

[Give feedback](#)

RCTab

1. Track spending on Azure
2. Manage budgets
3. Notify users of spending
4. Turn off subscriptions





Welcome David Llewellyn-Jones









Your actual usage may be higher than the values you see here. You should always verify your Azure usage on the Azure portal, which you can do by clicking on the value in the **Total Cost** column and then choosing **Amortized cost** metric on the Azure portal.

Azure subscriptions

View budgets and usage for all your Azure subscriptions

☒ Show abolished subscriptions

Search:

	Subscription ID	Subscription Name	Expiry Date	Status	Approved	Allocated	Total Costs	Remaining
	ea2d03d4-89de-4f3c-a039-4a2229094b4b	RCTab	2024-04-01	Enabled	£3400.00	£3400.00	£1711.52	£1688.48
	8f9d0941-6220-4467-b875-edb1d1952e9a	RCTab-test	None	Disabled	£0.00	£0.00	£0.00	£0.00
	dc21d235-eb0b-4285-9bd1-6bfcf31b8335	RCTabManualTestCase1	2022-02-15	Disabled	£0.00	£0.00	£0.00	£0.00
	135a862e-87b7-4129-8b64-773ef0159ac7	RCTabManualTestCase2	2022-04-01	Disabled	£0.00	£0.00	£0.00	£0.00
	b45986be-c9a4-4ca3-9d1f-3111e968e55f	RCTabTesting1	2023-10-14	Disabled	£0.00	£0.00	£0.00	£0.00
	92492a18-268c-44ec-a6f7-8471bb5adf61	RCTabTestSub1	2022-03-31	Disabled	£23.26	£23.26	£23.26	£0.00
	73905c90-9db8-4ebe-afdd-3a2c9fe45007	RCTabTestSub2	2022-04-01	Disabled	£0.00	£0.00	£0.00	£0.00
	b8963ae3-17d7-4325-8832-21360485edc9	testing-rctab-controller	None	Disabled	£0.00	£0.00	£0.00	£0.00

Showing 1 to 8 of 8 entries (filtered from 313 total entries)

RCTab

ea2d03d4-89de-4f3c-a039-4a2229094b4b

Expiry Date	Status	Approved	Allocated	Total Costs	Remaining
2024-04-01	Enabled	£3400.00	£3400.00	£1711.52	£1688.48

Useful cost analysis views

The following links will take you to useful cost analysis views for this subscription.

Past spending views will explain accumulated costs, including cost by resource. Current spending views show costs for a present period and give an estimation of future costs.

Past spending

- [Monthly cost by resource for the past six months](#)
- [Daily cost by resource for the past thirty days](#)

Current and projected spending

- [Cost by resource this month](#)
- [Cost by resource this year](#)

The following tabs provide additional information.

[Approvals and Allocations](#) [Finance and Cost Recovery](#) [Users with access](#) [Usage](#)

Details of subscription approvals and allocations

Approvals

Ticket	Starts	Ends	Amount	Created On
C2307-007	2023-07-04	2023-09-05	£1000.0	2023-07-04
C2307-007	2023-08-30	2024-01-05	£2400.0	2023-08-30
C2401-007	2024-01-04	2024-04-01	£0.0	2024-01-04

Allocations

Ticket	Amount	Created On
C2307-007	£1000.0	2023-07-04
C2307-007	£2400.0	2023-08-30

```
(shell) flypig$ rctab sub --help
Usage: rctab sub [OPTIONS] COMMAND [ARGS]...
```

Manage Azure subscriptions

Options:

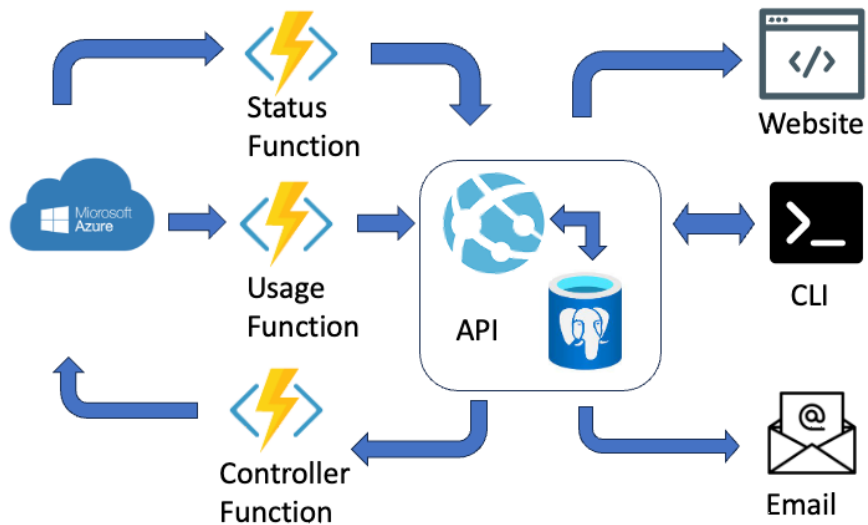
--help Show this message and exit.

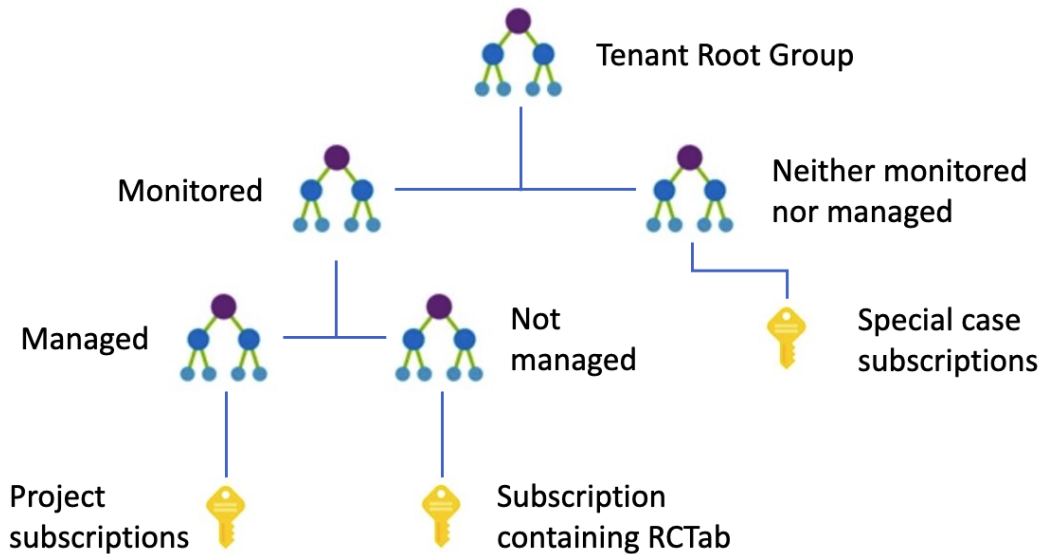
Commands:

add	Add an existing subscription to the billing system and...
allocate	Allocate credits a subscription.
allocations	List all allocations for a subscription.
approvals	List all approvals for a subscription.
approve	Approve credits for a subscription.
cost-recovery	Recover costs for a given month.
finance	Manage subscription finance
set-persistence	Change the persistence of a subscription.
summary	Get a summary of approvals, allocations and costs for...

```
(shell) flypig$
```

```
(shell) flypig$ rctab sub approve --subscription-id "01234567-89ab-cdef-0123-456789abcdef" \  
> --ticket "D1151-221" --amount 500 --date-to 2025-01-01 --allocate
```





Converting to Open Source

1. Private internal project for 3 years
2. Code audit before making public
3. Check for secrets; unused functionality; style
4. Using Gitleaks, Vulture and a lot of `grep`
5. Approx 25% removed, 25% refactored
6. Two repos, two deployments during switch

Infrastructure as Code

1. Deployed using Pulumi
2. Why not Terraform, PowerShell or Kubinetes?



(rctab-infrastructure-py3.11) → rctab-infrastructure git:(docs) ✖ pulumi up

Previewing update (temp)

View in Browser (Ctrl+O): <https://app.pulumi.com/researchcomputeplatforms/RCTab/temp/previews/1e5951b8-8ff0-470d-951c-667c8cf56801>

Type	Name	Plan
+ pulumi:pulumi:Stack	RCTab-temp	create
+ tls:index:PrivateKey	status-app-key	create
+ tls:index:PrivateKey	usage-app-key	create
+ tls:index:PrivateKey	controller-app-key	create
+ azure-native:resources:ResourceGroup	rctab-central-logging-myorg-temp-	create
+ azure-native:resources:ResourceGroup	rctab-myorg-temp-	create
+ postgresql:index:Grant	create_schema_grant_user	create
+ azure-native:web:WebApp	c-function-myorg-temp-	create
+ azure-native:web:WebApp	u-function-myorg-temp-	create
+ azure-native:web:WebApp	s-function-myorg-temp-	create

Outputs:

```
getStartedEndpoint-turingrc/rctab-controller:1.latest: output<string>
getStartedEndpoint-turingrc/rctab-status:1.latest    : output<string>
getStartedEndpoint-turingrc/rctab-usage:1.latest     : output<string>
```

Resources:

+ 38 to create

Do you want to perform this update? [Use arrows to move, type to filter]

yes
➤ no
details

Open Source From the Start

Why not Open Source from the start?

1. Reduces risks
2. Initially a purely internal project

Why switch it to Open Source?

1. A lot of refactoring work had already been done
2. It solves a problem other institutions face
3. Critical mass of *generalisability* and *benefit*

Conclusions

1. Managing Cloud costs at an institutional level is challenging
2. RCTab provides a battle-worn solution
3. We expected a competitor solution, but there just wasn't and still isn't
4. Opening the source was time-consuming but worthwhile



Further info

RCTab repo <https://github.com/alan-turing-institute/rctab>

RCTab docs <https://rctab.readthedocs.io/>

REG [https://www.turing.ac.uk/work-turing/research/
research-engineering-group](https://www.turing.ac.uk/work-turing/research/research-engineering-group)