

# Leveraging Multiple Cloud Orchestration

05/18/2019

Yas Naoi

Principal Architect, Cloud  
DOCOMO Innovations, Inc.

# Yas



# Yas

- Principal Architect, Cloud



# Yas

- Principal Architect, Cloud
- DOCOMO Innovations, Inc. (Palo Alto, CA)
- DOCOMO Inc. (NYSE: DCM)



# Yas

- Principal Architect, Cloud
- DOCOMO Innovations, Inc. (Palo Alto, CA)
- DOCOMO Inc. (NYSE: DCM)
- Cloud, DevOps, Agile Software Development
- d.o: 14 years 3 months



# Drupal Contributed Module: Cloud

<https://drupal.org/project/cloud>

The screenshot displays the Cloud Orchestrator web interface. At the top, there is a navigation bar with 'Manage', 'Shortcuts', and 'cloud\_admin'. Below this is a breadcrumb trail: 'Cloud Service Providers / All AWS Cloud Instances / AWS Cloud Instances'. The main heading is 'AWS Cloud Instances', with sub-tabs for 'Instances', 'Images', 'Security Groups', 'Elastic IPs', 'Network Interfaces', 'Key Pairs', 'Volumes', 'Snapshots', and 'Instance Type Prices'. A green button 'Add | Launch AWS Cloud Instance' and a 'Refresh' button are visible. A dropdown menu shows 'Items per page' set to 50. A table lists various instances with columns for Name, Public IP, Instance State, Instance Type, Availability Zone, Created, and Operations links. A 'Cloud Service Providers' sidebar is on the right.

Name	Public IP	Instance State	Instance Type	Availability Zone	Created	Operations links
Cloud Orchestrator	35.161.246.100	running	t3.small	us-west-2a	2019/03/14 - 20:13	Edit
Ubuntu 18.04 LTS 20190403	54.200.155.1	running	t3.micro	us-west-2a	2019/04/10 - 15:28	Edit
SagemakerDemo	52.12.110.234	running	t2.micro	us-west-2a	2019/05/09 - 18:11	Edit
test2		running	t3.small	us-west-2a	2019/05/15 - 01:47	Edit
Jenkins-master	50.112.45.247	running	t3.micro	us-west-2b	2016/09/15 - 17:14	Edit
Jenkins-slave-sphinx	52.41.103.166	running	t3.nano	us-west-2a	2016/09/27 - 12:19	Edit
CostVisualizer3-20181223a-DII	54.186.37.162	running	t3.small	us-west-2a	2018/12/23 - 16:27	Edit
モニター	52.42.238.236	stopped	t2.micro	us-west-2b	2017/06/06 - 15:32	Edit
Cloud Orchestrator - EC2 - Dev Instance	34.216.163.223	stopped	t2.medium	us-west-2a	2018/04/23 - 20:31	Edit

Copyright © 2018-2019 DOCOMO Innovations, Inc. ver.8.x-1.1-beta2

# Agenda

# Agenda

- Multiple Cloud Orchestration Concept
- Value Proposition
- Goal: A Self-Service Portal
- Cloud Orchestrator
- Demo



# Multiple Cloud Orchestration Concept

# Multiple Cloud Orchestration Concept

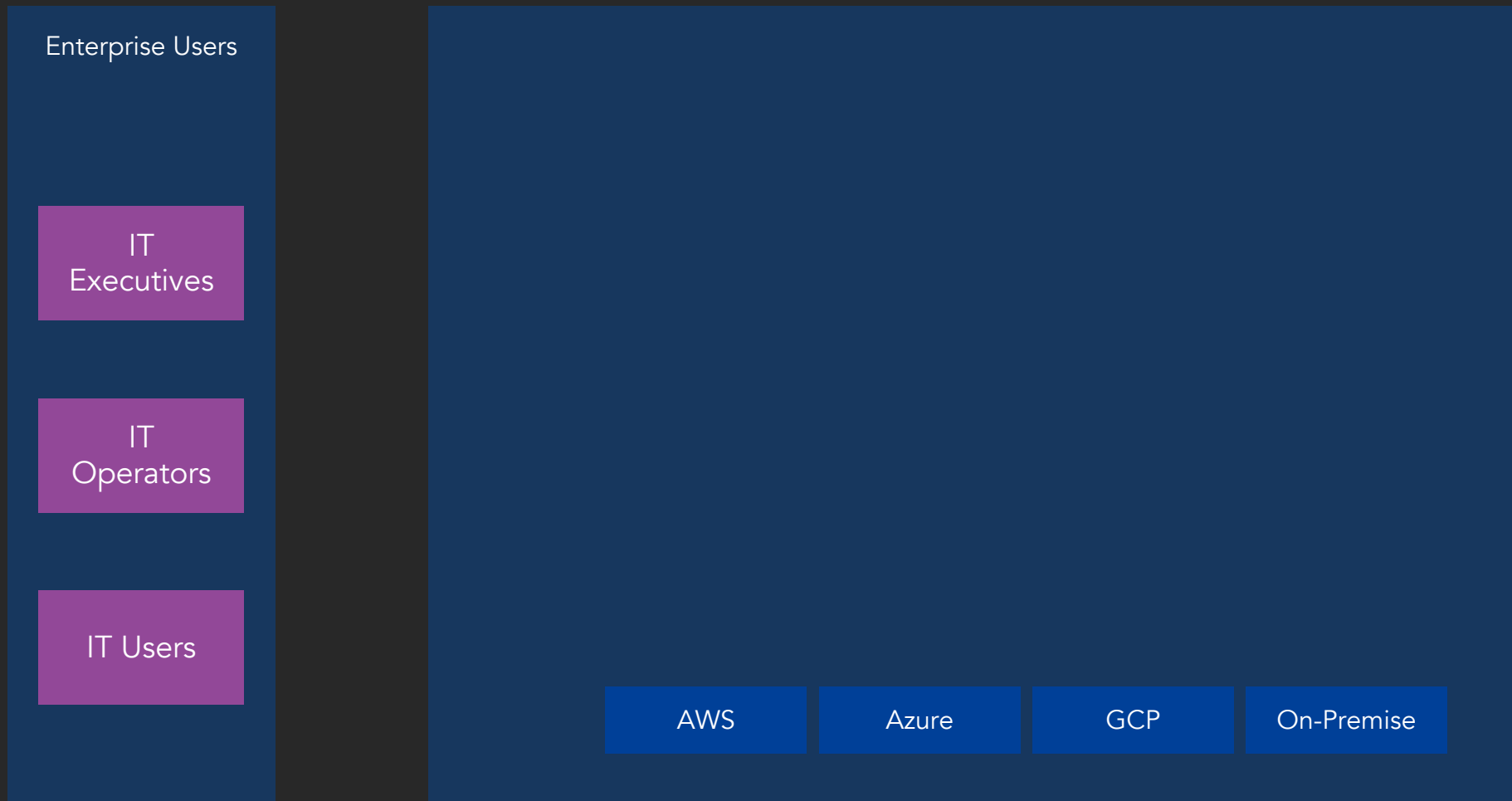
Enterprise Users

IT  
Executives

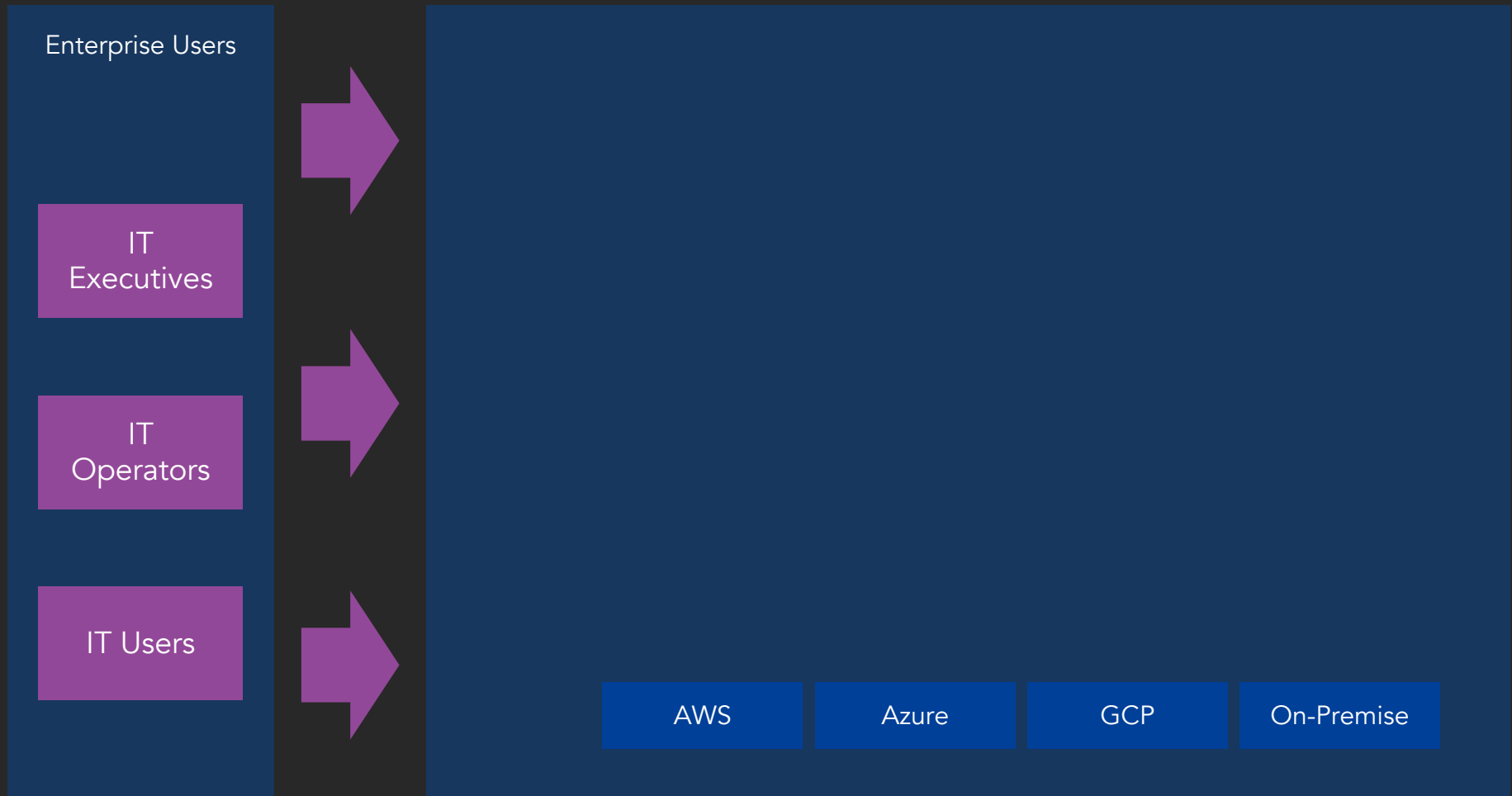
IT  
Operators

IT Users

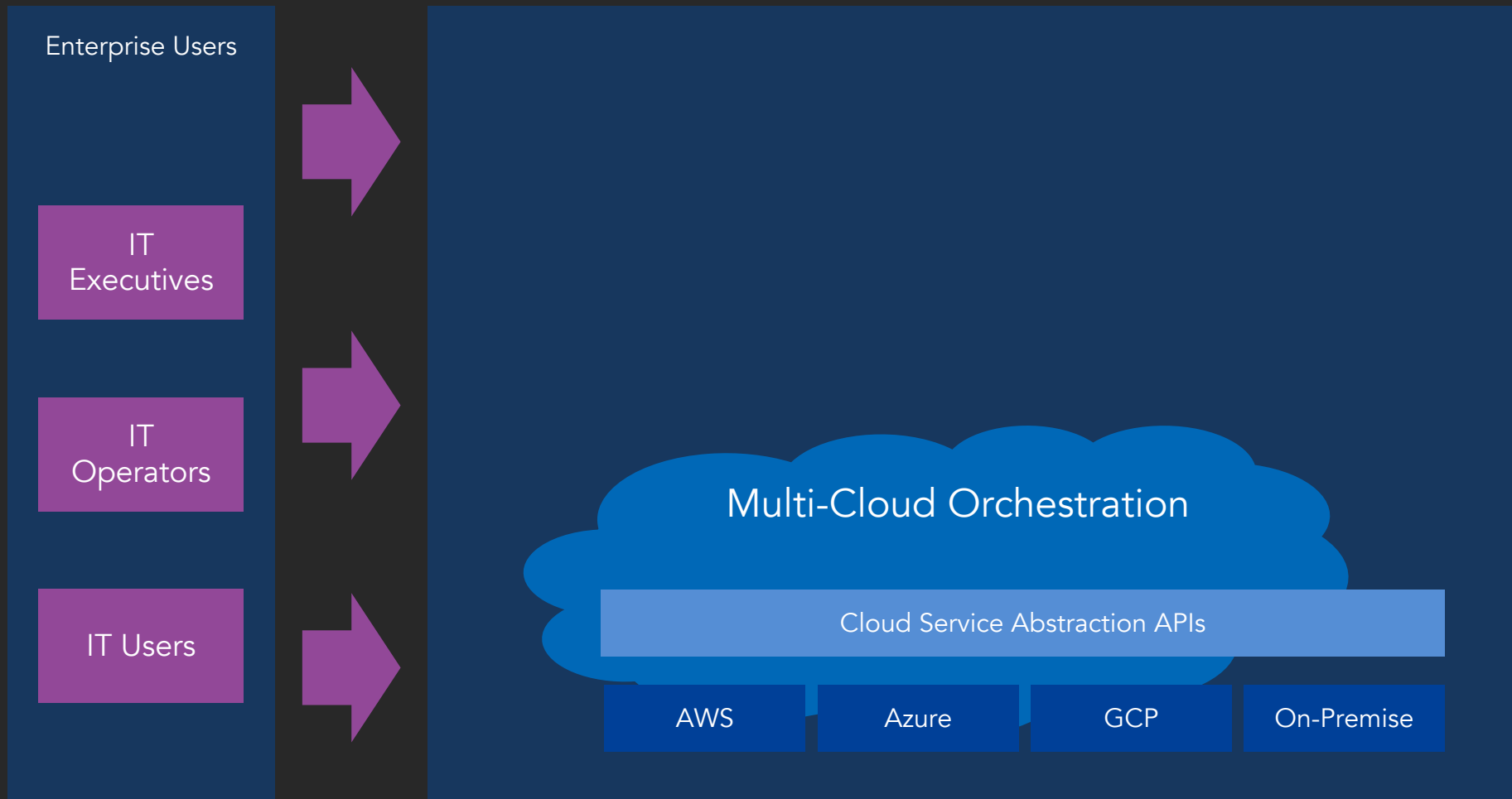
# Multiple Cloud Orchestration Concept



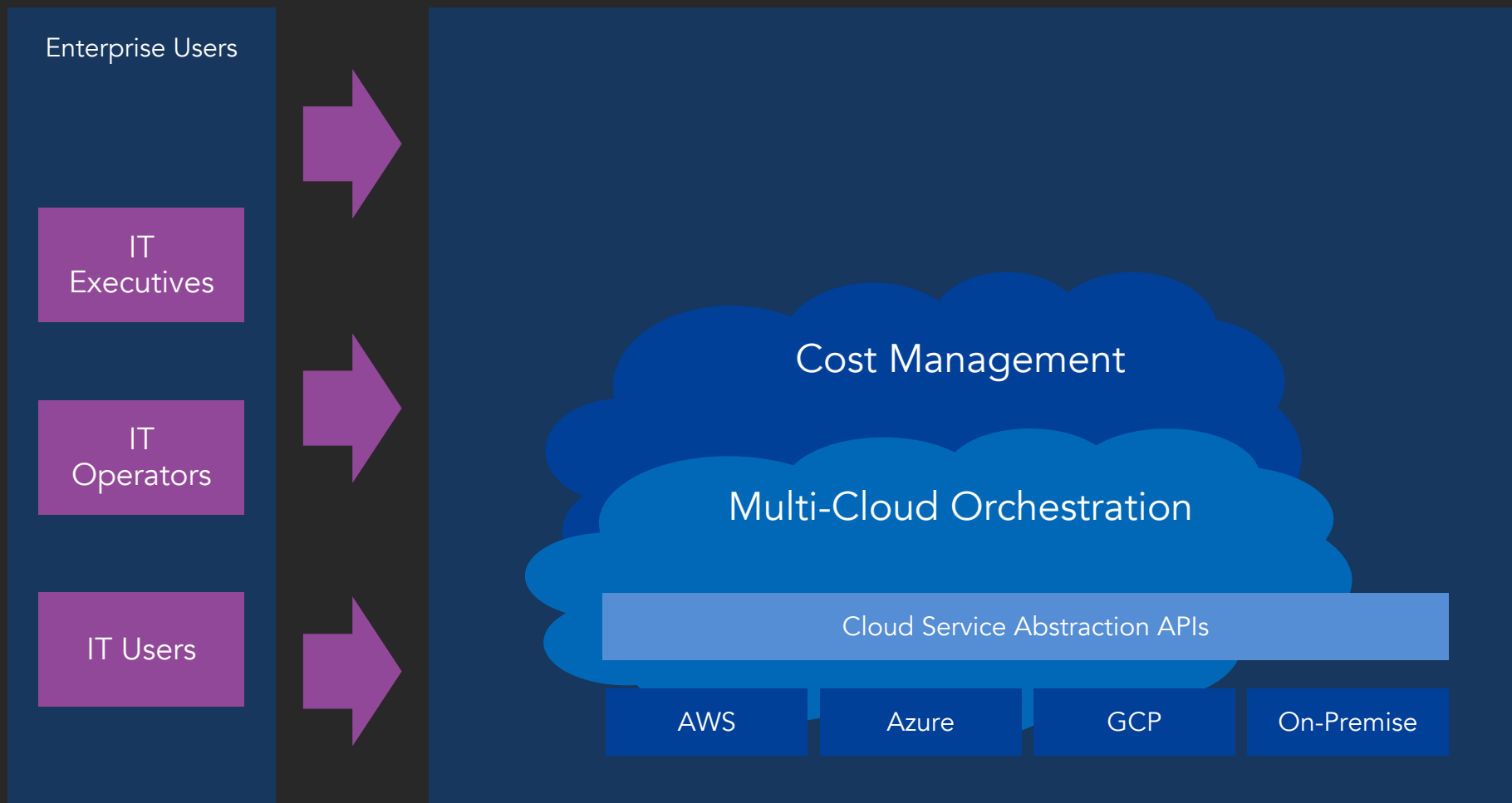
# Multiple Cloud Orchestration Concept



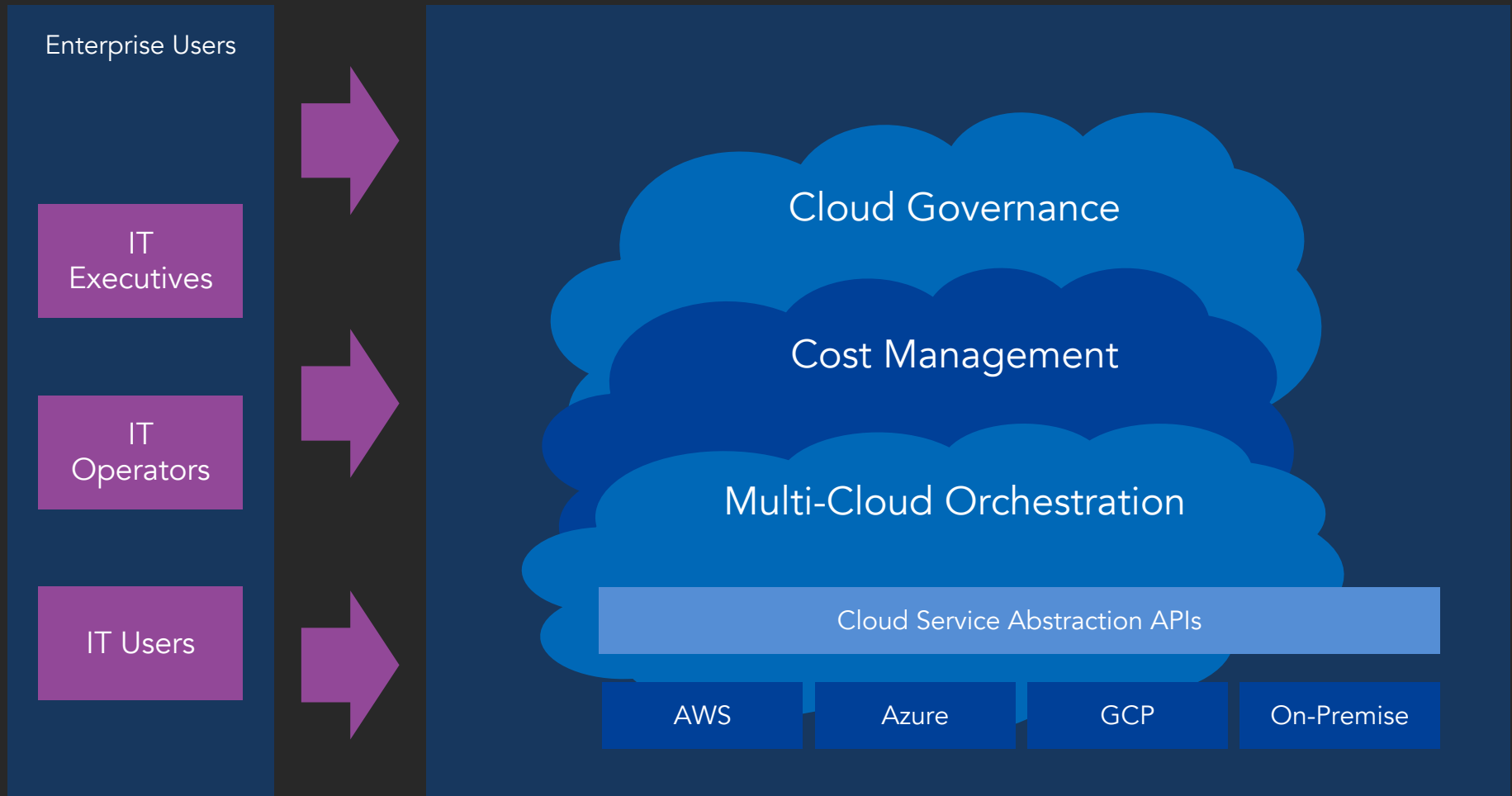
# Multiple Cloud Orchestration Concept



# Multiple Cloud Orchestration Concept



# Multiple Cloud Orchestration Concept

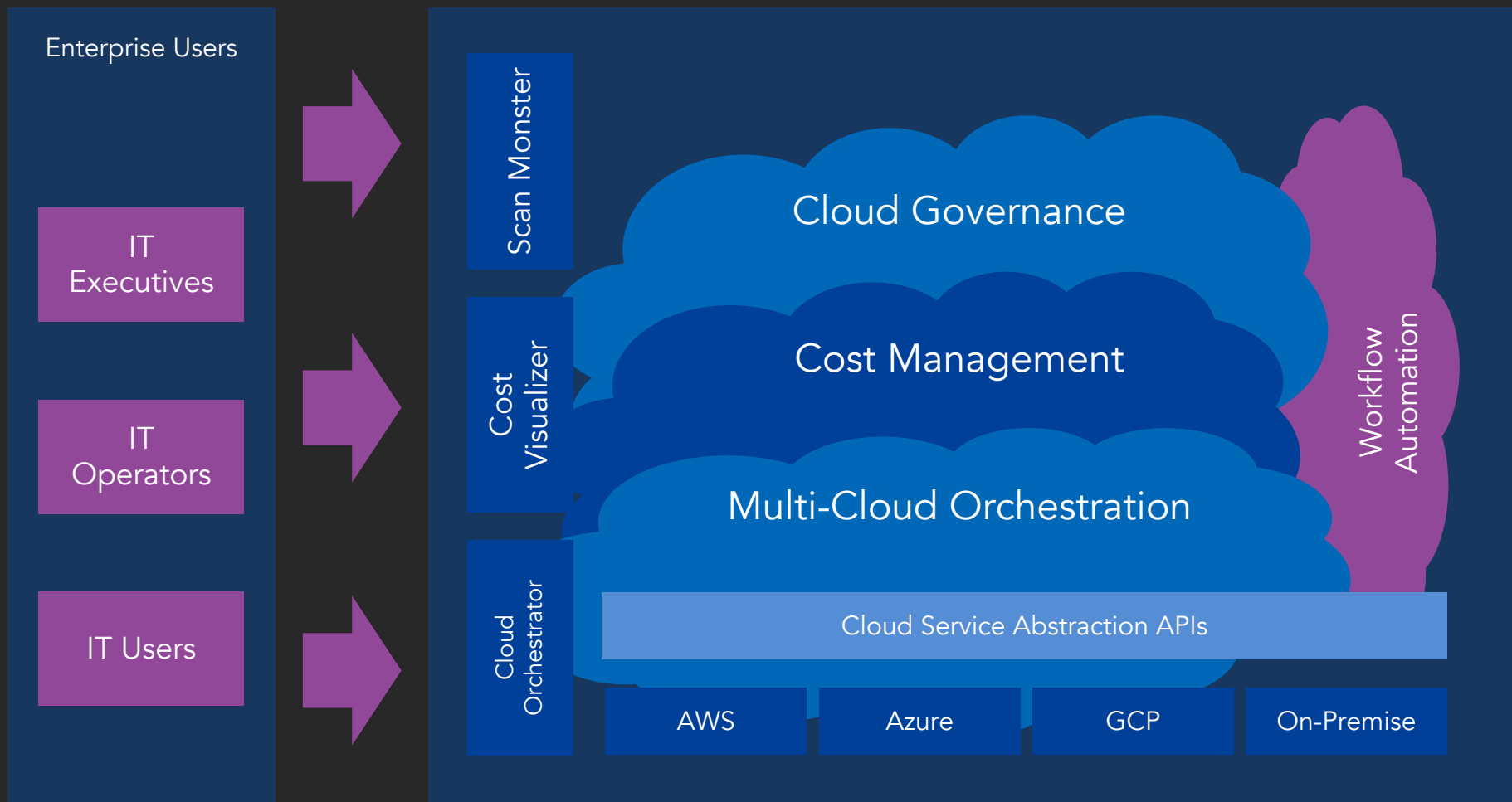


# Multiple Cloud Orchestration Concept





# Multiple Cloud Orchestration Concept



# Value Proposition

# Value Proposition

- Agility of Time to Market by Cloud Consumption
- Cloud TCO
- Cloud Governance

# Value Proposition

- Agility of Time to Market by Cloud Consumption
- Cloud TCO
- Cloud Governance

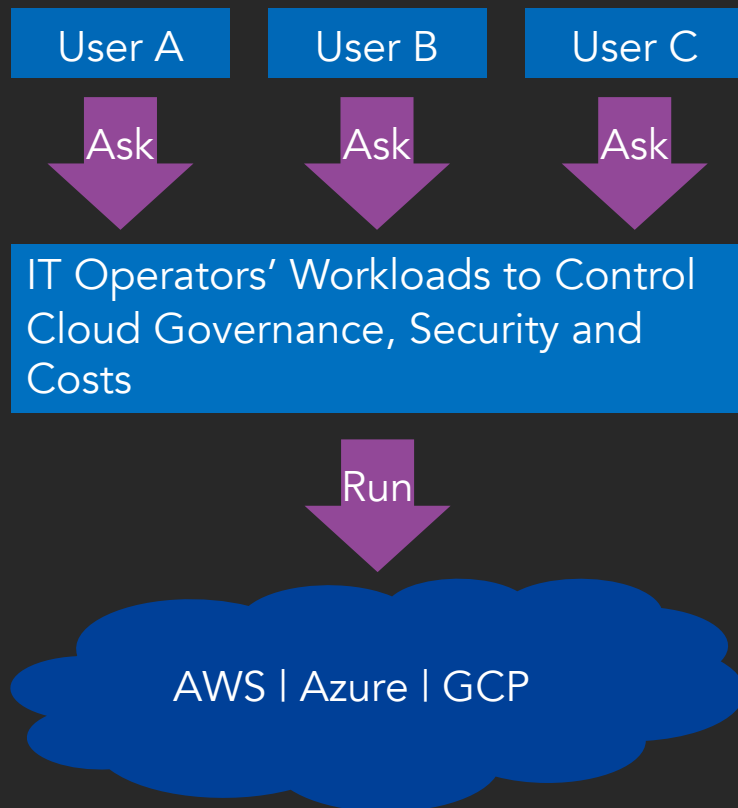


## Best Practices

- Cost Analytics and Optimization
- Cost Management
- Multi-Cloud Orchestration (AWS, GCP and Azure)
- Agile Software Development

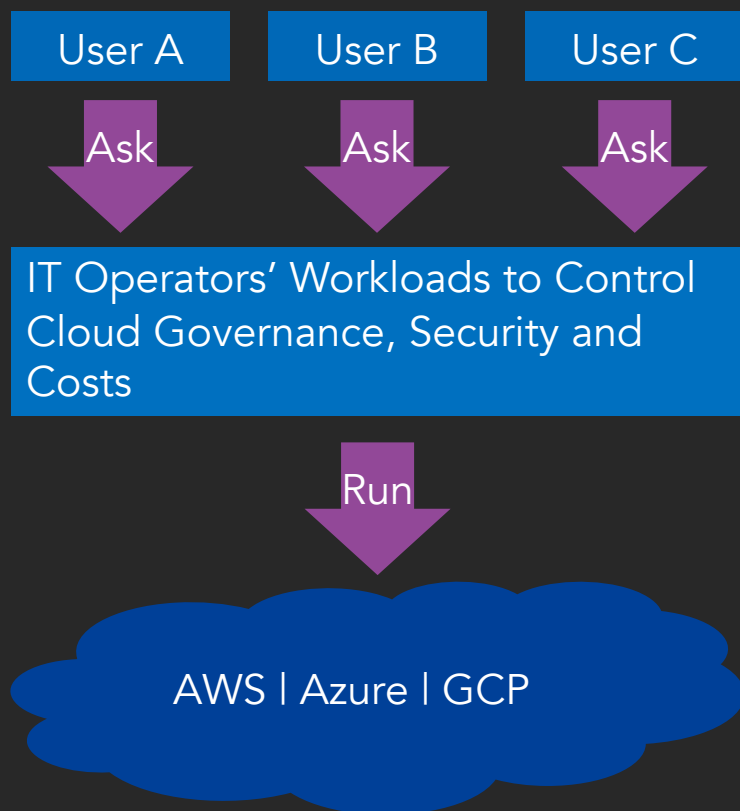
# Goal: A Self-Service Portal

# Goal: A Self-Service Portal



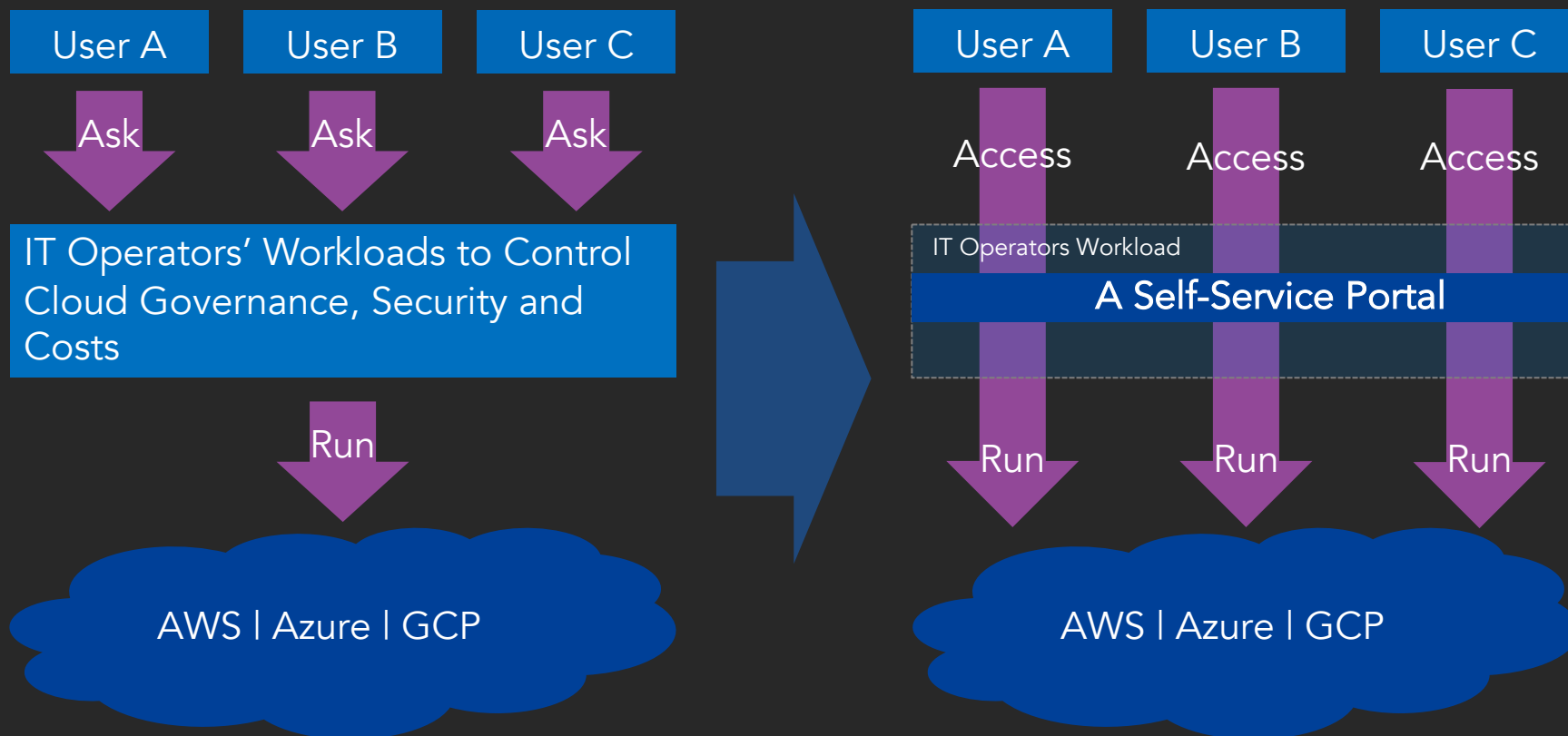
# Goal: A Self-Service Portal

- Enable *self-provisioning by user* to change the operation from "Ask" to "Access" thru *A Self-Service Portal* to reduce Cloud management cost by IT operators



# Goal: A Self-Service Portal

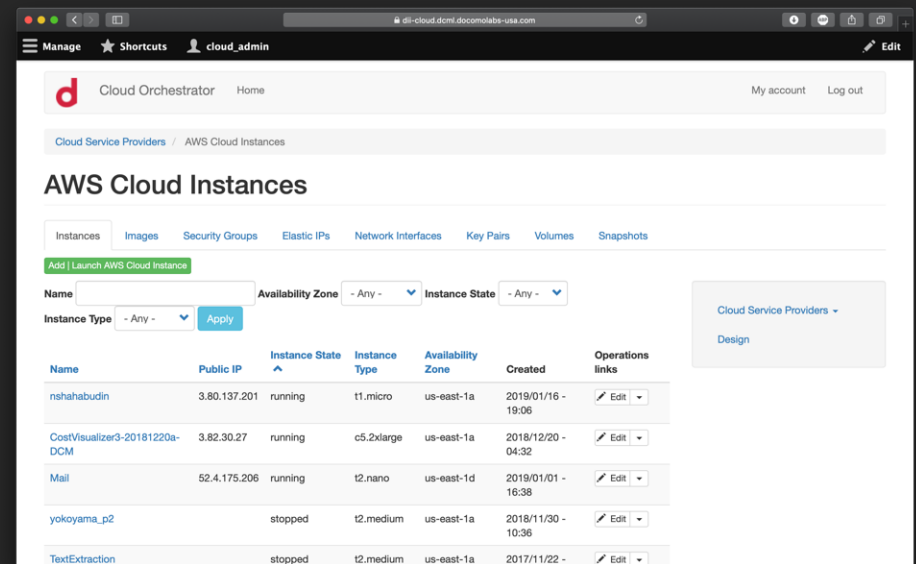
- Enable *self-provisioning by user* to change the operation from "Ask" to "Access" thru *A Self-Service Portal* to reduce Cloud management cost by IT operators





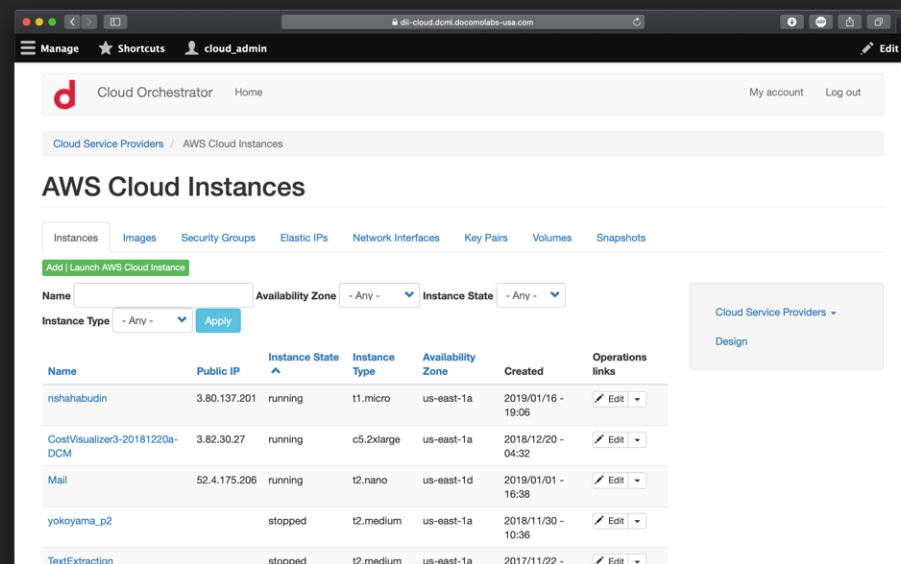
# Introducing Cloud Orchestrator

# Introducing Cloud Orchestrator



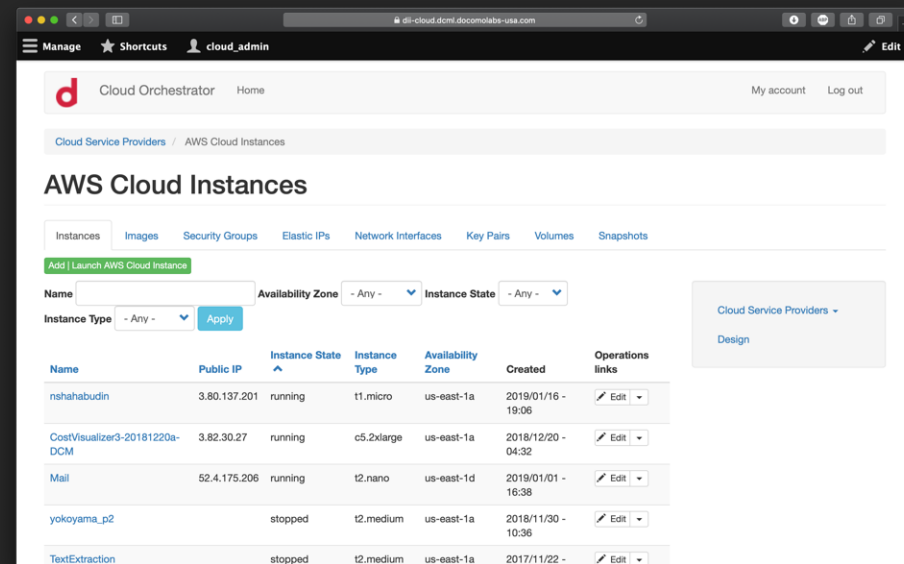
# Introducing Cloud Orchestrator

- AWS Self-Service Portal for EC2
  - SSO through user's own Active Directory account
  - Easy to launch and manage user's own instances (especially GPU)



# Introducing Cloud Orchestrator

- **AWS Self-Service Portal for EC2**
  - SSO through user's own Active Directory account
  - Easy to launch and manage user's **own** instances (especially GPU)
- **Open Source**
  - <https://drupal.org/project/cloud>
  - Automated testing
  - Software releases management
- **Agile Software Development**
  - Superfast-paced development
  - Higher productivity



# Demo

# Screenshots

The screenshot displays the Cloud Orchestrator web interface. At the top, there is a navigation bar with 'Manage', 'Shortcuts', and 'admin' (with an 'Edit' icon). Below this is a secondary navigation bar with icons for 'Content', 'Structure', 'Appearance', 'Extend', 'Configuration', 'People', 'Reports', and 'Help'. The main header area includes the 'Cloud Orchestrator' logo, 'Home' link, and 'My account' / 'Log out' options. The breadcrumb trail reads 'Cloud Service Providers / All AWS Cloud Instances / AWS Cloud Instances'. The main section is titled 'AWS Cloud Instances' and contains sub-tabs for 'Instances', 'Images', 'Security Groups', 'Elastic IPs', 'Network Interfaces', 'Key Pairs', 'Volumes', and 'Snapshots'. Below the tabs is a link for 'Instance Type Prices'. A green button 'Add | Launch AWS Cloud Instance' and a 'Refresh' button are visible. A dropdown menu for 'Items per page' is set to '50' with an 'Apply' button. On the right, there is a 'Cloud Service Providers' dropdown menu with 'Design' selected. The main content is a table of instances:

Name	Public IP	Instance State	Instance Type	Availability Zone	Created	Operations links
Jenkins-master	50.112.45.247	running	t3.micro	us-west-2b	02/01/2019 - 13:06	Edit
Jenkins-slave-sphinx	52.41.103.166	running	t3.nano	us-west-2a	02/01/2019 - 13:07	Edit
CostVisualizer3-20181223a-DII	54.186.37.162	running	t3.small	us-west-2a	02/14/2019 - 10:26	Edit
Cloud Orchestrator	35.161.246.100	running	t3.small	us-west-2a	03/14/2019 - 20:13	Edit
Ubuntu 18.04 LTS 20190403	54.200.155.1	running	t3.micro	us-west-2a	04/10/2019 - 15:28	Edit
モニター	52.42.238.236	stopped	t2.micro	us-west-2b	02/15/2019	Edit

# Cost-aware Features (1/2)

The left screenshot shows the 'Instance Type' selection interface. A search bar contains 't3'. The table below lists various instance types with their specifications and hourly rates.

Type	vCPUs	ECUs	Memory (GiB)	Hourly Rate (\$)
t3.nano	2	Variable	0.5 GiB	0.0052
t3.micro	2	Variable	1 GiB	0.0104
t3.small	2	Variable	2 GiB	0.0208
t3.medium	2	Variable	4 GiB	0.0416
t3.large	2	Variable	8 GiB	0.0832
t3.xlarge	4	Variable	16 GiB	0.1664
t3.2xlarge	8	Variable	32 GiB	0.3328
t3a.nano	2	Variable	0.5 GiB	0.0047
t3a.micro	2	Variable	1 GiB	0.0094
t3a.small	2	Variable	2 GiB	0.0188

The right screenshot shows the 'Launch' confirmation screen for an instance from 'Ubuntu 18.04 LTS 20190403?'. It features a 'Cost' table with the following data:

Instance Type	On-demand Hourly (\$)	On-demand Daily (\$)	On-demand Monthly (\$)	On-demand Yearly (\$)	RI 1 Year (\$)	RI 3 Year (\$)
t3.nano	0.0052	0.12	3.80	46	27	51
t3.micro	0.0104	0.25	7.60	91	53	103
t3.small	0.0208	0.50	15.19	182	107	206
t3.medium	0.0416	1.00	30.39	365	213	412
t3.large	0.0832	2.00	60.78	729	426	823
t3.xlarge	0.1664	3.99	121.56	1,459	853	1,646
t3.2xlarge	0.3328	7.99	243.11	2,917	1,706	3,293

# Cost-aware Features (2/2)

AWS Cloud Instance Type Pricing of DII - Oregon

Instance Type	On-demand Hourly (\$)	On-demand Daily (\$)	On-demand Monthly (\$)	On-demand Yearly (\$)	RI 1 Year (\$)	RI 3 Year (\$)
a1.medium	0.0255	0.61	18.63	224	131	252
a1.large	0.051	1.22	37.26	447	263	504
a1.xlarge	0.102	2.45	74.51	894	525	1,008
a1.2xlarge	0.204	4.9	149.02	1,788	1,051	2,016
a1.4xlarge	0.408	9.79	298.04	3,577	2,102	4,032
c3.large	0.105	2.52	76.7	920	542	1,020
c3.xlarge	0.21	5.04	153.41	1,841	1,093	2,066
c3.2xlarge	0.42	10.08	306.81	3,682	2,170	4,132
c3.4xlarge	0.84	20.16	613.62	7,363	4,350	8,265
c3.8xlarge	1.68	40.32	1,227.24	14,727	8,691	16,506
c4.large	0.1	2.4	73.05	877	515	1,013
c4.xlarge	0.199	4.78	145.37	1,744	1,039	2,050
c4.2xlarge	0.398	9.55	290.74	3,489	2,078	4,076
c4.4xlarge	0.796	19.1	581.48	6,978	4,146	8,152
c4.8xlarge	1.591	38.18	1,162.23	13,947	8,293	16,329
c5.large	0.085	2.04	62.09	745	438	815
c5.xlarge	0.17	4.08	124.19	1,490	876	1,629
c5.2xlarge	0.34	8.16	248.37	2,980	1,751	3,259
c5.4xlarge	0.68	16.32	496.74	5,961	3,503	6,518
c5.9xlarge	1.53	36.72	1,117.67	13,412	7,881	14,665
c5.18xlarge	3.06	73.44	2,235.33	26,824	15,762	29,330
c5d.large	0.096	2.3	70.13	842	495	922
c5d.xlarge	0.192	4.61	140.26	1,683	990	1,844
c5d.2xlarge	0.384	9.22	280.51	3,366	1,980	3,688
c5d.4xlarge	0.768	18.43	561.02	6,732	3,961	7,377
c5d.9xlarge	1.728	41.47	1,262.30	15,148	8,911	16,597
c5d.18xlarge	3.456	82.94	2,524.61	30,295	17,823	33,195
c5n.large	0.108	2.59	78.89	947	556	897

Cloud Orchestrator

AWS Cloud Instance Type Prices

Instance Type	On-demand Hourly (\$)	On-demand Daily (\$)	On-demand Monthly (\$)	On-demand Yearly (\$)	RI 1 Year (\$)	RI 3 Year (\$)
a1.medium	0.0255	0.61	18.63	224	131	252
a1.large	0.0510	1.22	37.26	447	263	504
a1.xlarge	0.1020	2.45	74.51	894	525	1,008
a1.2xlarge	0.2040	4.90	149.02	1,788	1,051	2,016
a1.4xlarge	0.4080	9.79	298.04	3,577	2,102	4,032
c3.large	0.1050	2.52	76.70	920	542	1,020
c3.xlarge	0.2100	5.04	153.41	1,841	1,093	2,066
c3.2xlarge	0.4200	10.08	306.81	3,682	2,170	4,132
c3.4xlarge	0.8400	20.16	613.62	7,363	4,350	8,265
c3.8xlarge	1.6800	40.32	1,227.24	14,727	8,691	16,506
c4.large	0.1000	2.40	73.05	877	515	1,013
c4.xlarge	0.1990	4.78	145.37	1,744	1,039	2,050
c4.2xlarge	0.3980	9.55	290.74	3,489	2,078	4,076
c4.4xlarge	0.7960	19.10	581.48	6,978	4,146	8,152



# Notifications

- Long-running Instance
- Unused Volumes

▼ INSTANCE

▼ NOTIFICATION SETTINGS

Enable instance notification  
 When enabled, instance owners or admins will be notified if their instance has been running for too long.

Notify owner  
 When selected, instance owners will be notified.

Notification frequency  
  
 Instance owners will be notified once per option selected

Notification criteria  
  
 Notify instance owners after an instance has been running for this period of time

Notification time  
 :   
 Time to send the instance usage email.

▶ EMAIL SETTINGS

---

▼ VOLUME

▼ NOTIFICATION SETTINGS

Enable volume notification  
 When enabled, an email will be sent if volumes are unused. Additionally, the created date field will be marked in red on the Volume listing page and Volume detail page.

Unused volume criteria  
  
 A volume is considered unused if it has been created and available for the specified number of days.

Notification frequency  
  
 Volume notification will be sent once per option selected.

Notification time  
 :   
 Time to send the volume usage email.

▶ EMAIL SETTINGS

Cloud Orchestrator has been running for since 2019-03-14 20:13:01 -0700

メッセージ

削除 アーカイブ 返信 全員に返信 転送 添付ファイル 移動 迷惑メール ルール [その他]に移動する 開封済み/未読

Cloud Orchestrator has been running for since 2019-03-14 20:13:01 -0700

**Cloud Orchestrator <no-reply@...>**  
 Yas Naoi; no-reply@...  
 2019年5月8日 水曜日 11:36  
[詳細を表示する](#)

Your instance Cloud Orchestrator has been running since 2019-03-14 20:13:01 -0700. Please review if the instance still needs to be running.

Unused aws volumes

**Cloud Orchestrator <no-reply@...>**  
 Yas Naoi  
 2019年5月8日 水曜日 10:41  
[詳細を表示する](#)

The following volumes are not in use. Please review them.

-----  
 Volume name: yokoyama  
 Volume url: [https://.../clouds/aws\\_cloud/aws\\_us\\_east\\_1/volume/21](https://.../clouds/aws_cloud/aws_us_east_1/volume/21)  
 Unused since: 2018-11-19 13:55:24 -0800  
 -----

Volume name: vol-07bb88c9300982289  
 Volume url: [https://.../clouds/aws\\_cloud/aws\\_us\\_east\\_1/volume/26](https://.../clouds/aws_cloud/aws_us_east_1/volume/26)  
 Unused since: 2019-02-15 13:27:25 -0800  
 -----

# Thank you!

*"Coming together is a beginning, keeping together is a progress; working together is a success."  
- Henry Ford*