

Tutorial on Huawei Cloud

SG Healthcare AI Datathon 2020

Wang Han

Mornin's Lab

Saw Swee Hock School of Public Health

[hans0124sg.github.io](https://github.com/hans0124sg)



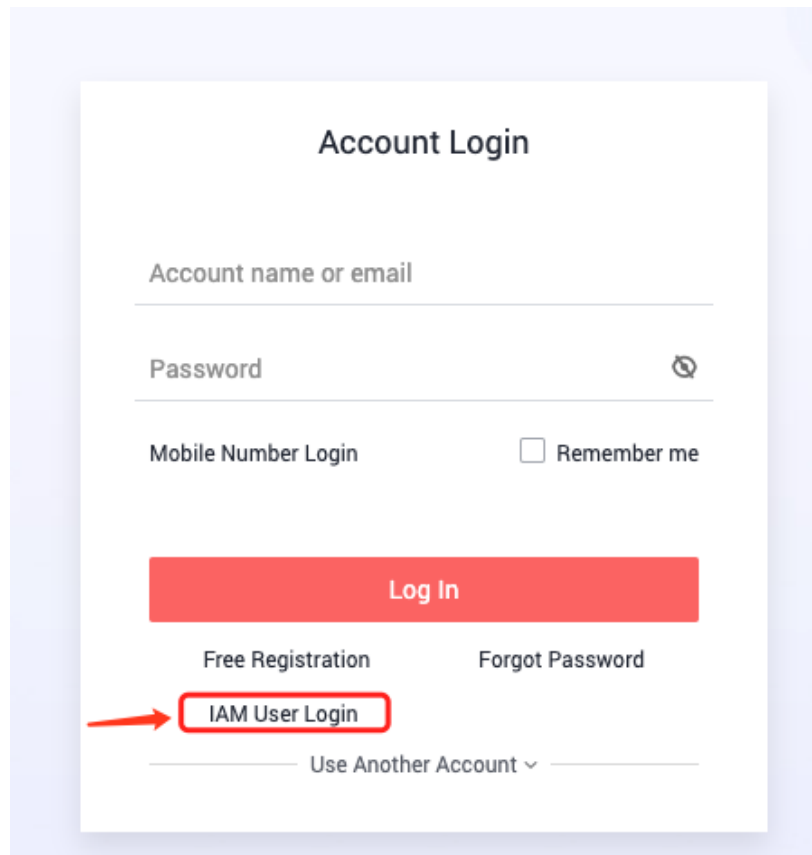
Components

- Elastic Cloud Server (ECS)
 - Remote CPU/GPU Server
- Relational Database Service (RDS) + Data Admin Service (DAS)
 - EHR Databases
- Object Storage Service (OBS)
 - Downloading Imaging Datasets to your ECS

Log into Huawei Cloud

<https://auth.huaweicloud.com/authui/login.html#/login>

<https://tinyurl.com/huaweicloud2020>



Account Login

Account name or email

Password

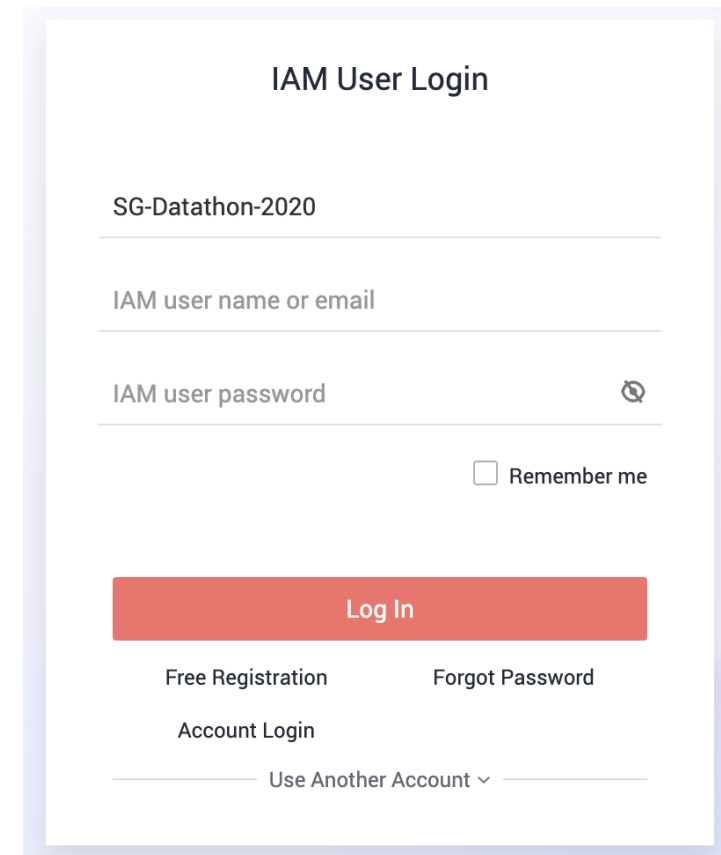
Mobile Number Login ☐ Remember me

Log In

Free Registration Forgot Password

IAM User Login

Use Another Account ▾



IAM User Login

SG-Datathon-2020

IAM user name or email

IAM user password

☐ Remember me

Log In

Free Registration Forgot Password

Account Login

Use Another Account ▾

Elastic Cloud Server (ECS)

The screenshot displays the Huawei Cloud console interface. At the top, the 'HUAWEI CLOUD' header includes a 'Console' tab and a region dropdown menu currently set to 'Hong-Kong'. A red arrow points to the 'AP-Hong-Kong' option in the expanded region list. The main content area is divided into several sections: 'My Resources [Hong-Kong]' on the left lists 'Elastic Cloud Server', 'Elastic Volume Service', and 'Elastic IP'. The center features a grid of resource counts for various services like 'Relational Database Service', 'Auto Scaling', 'Bare Metal Server', 'Volume Backup Service', 'Virtual Private Cloud', and 'Elastic Load Balance'. Below this is a 'Recently Visited Services' bar. The bottom section contains three panels: 'Cloud Eye [Hong-Kong]' with alarm and data status, 'ECS Resource Monitoring' showing CPU usage at 0.00% and disk read rate at 0.00KB/s, and 'Security Overview [Hong-Kong]' with threat and host risk counts. The right sidebar shows a user greeting and a 'Billing Center' link, along with summary cards for 'Orders to Ren...', 'Unpaid Orders', and 'Service Tickets'.

Service	Count
Relational Database Service	0
Auto Scaling	0
Bare Metal Server	0
Volume Backup Service	0
Virtual Private Cloud	1
Elastic Load Balance	0

Category	Count
Alarm	0
Insufficient Data	0

Metric	Value
CPU Usage	0.00%
Disk Read Rate	0.00KB/s

Category	Count
Threats	0
Host risks	0

Category	Count
Orders to Ren...	0
Unpaid Orders	0
Service Tickets	0

Elastic Cloud Server (ECS)

HUAWEI CLOUD | Console | Singapore

My Resources [Singapore]

Elastic Cloud Server	1	Relational Database Service	1
Elastic Volume Service	3	Volume Backup Service	0
Elastic IP	4		

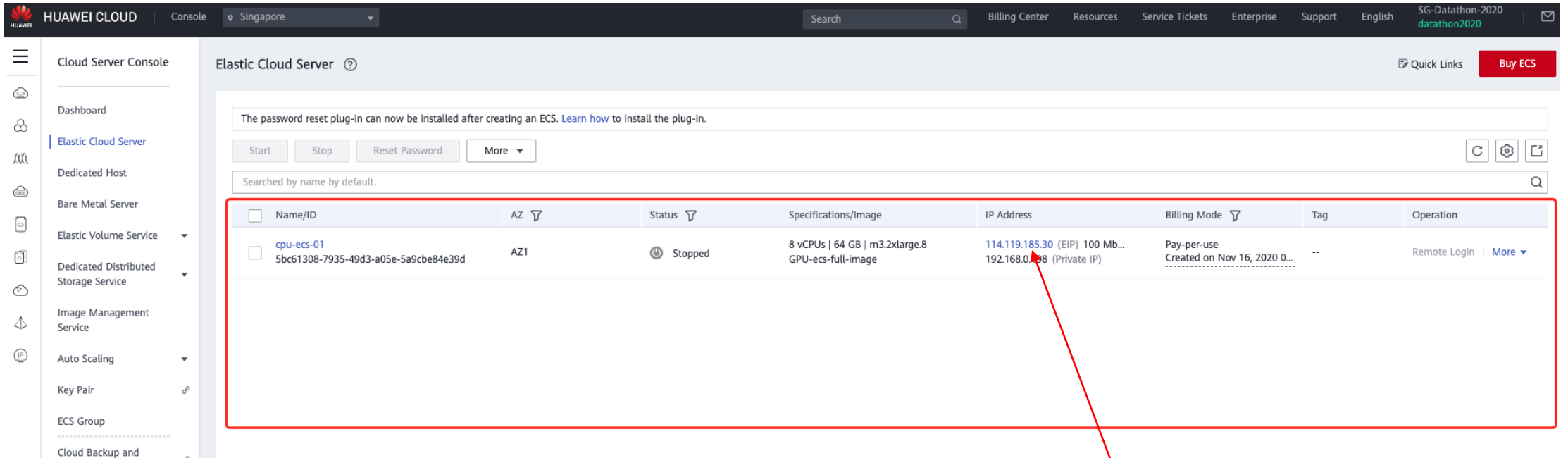
Recently Visited Services

Elastic Cloud Server | Relational Database Service | Identity and Access Management | Data Replication Service

Cloud Eye [Singapore] | **ECS Resource Monitoring**

Elastic Cloud Server (ECS)

- Find the ECS of your own team



The screenshot shows the Huawei Cloud console interface. The top navigation bar includes the Huawei Cloud logo, the region 'Singapore', a search bar, and links to Billing Center, Resources, Service Tickets, Enterprise, Support, and English. The left sidebar contains a menu with options like Cloud Server Console, Dashboard, Elastic Cloud Server, Dedicated Host, Bare Metal Server, Elastic Volume Service, Dedicated Distributed Storage Service, Image Management Service, Auto Scaling, Key Pair, ECS Group, and Cloud Backup and. The main content area is titled 'Elastic Cloud Server' and features a 'Buy ECS' button. Below the title, there is a message about the password reset plug-in and a set of buttons: Start, Stop, Reset Password, and More. A search bar indicates 'Searched by name by default.' The table below lists ECS instances with columns: Name/ID, AZ, Status, Specifications/Image, IP Address, Billing Mode, Tag, and Operation. A red box highlights the table, and a red arrow points to the IP address column.

Name/ID	AZ	Status	Specifications/Image	IP Address	Billing Mode	Tag	Operation
<input type="checkbox"/> cpu-ecs-01 5bc61308-7935-49d3-a05e-5a9cbe84e39d	AZ1	Stopped	8 vCPUs 64 GB m3.2xlarge.8 GPU-ecs-full-image	114.119.185.30 (EIP) 100 Mb... 192.168.0.18 (Private IP)	Pay-per-use Created on Nov 16, 2020 0...	--	Remote Login More

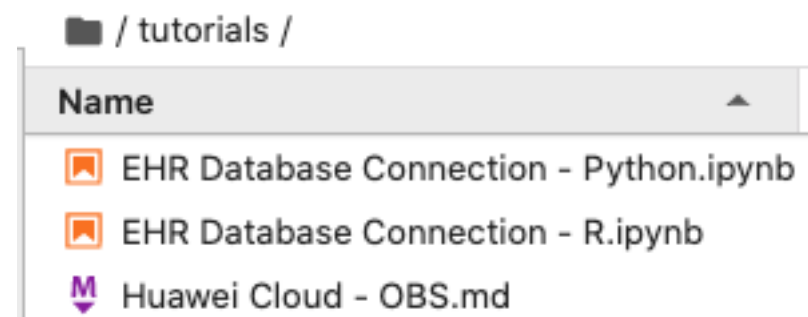
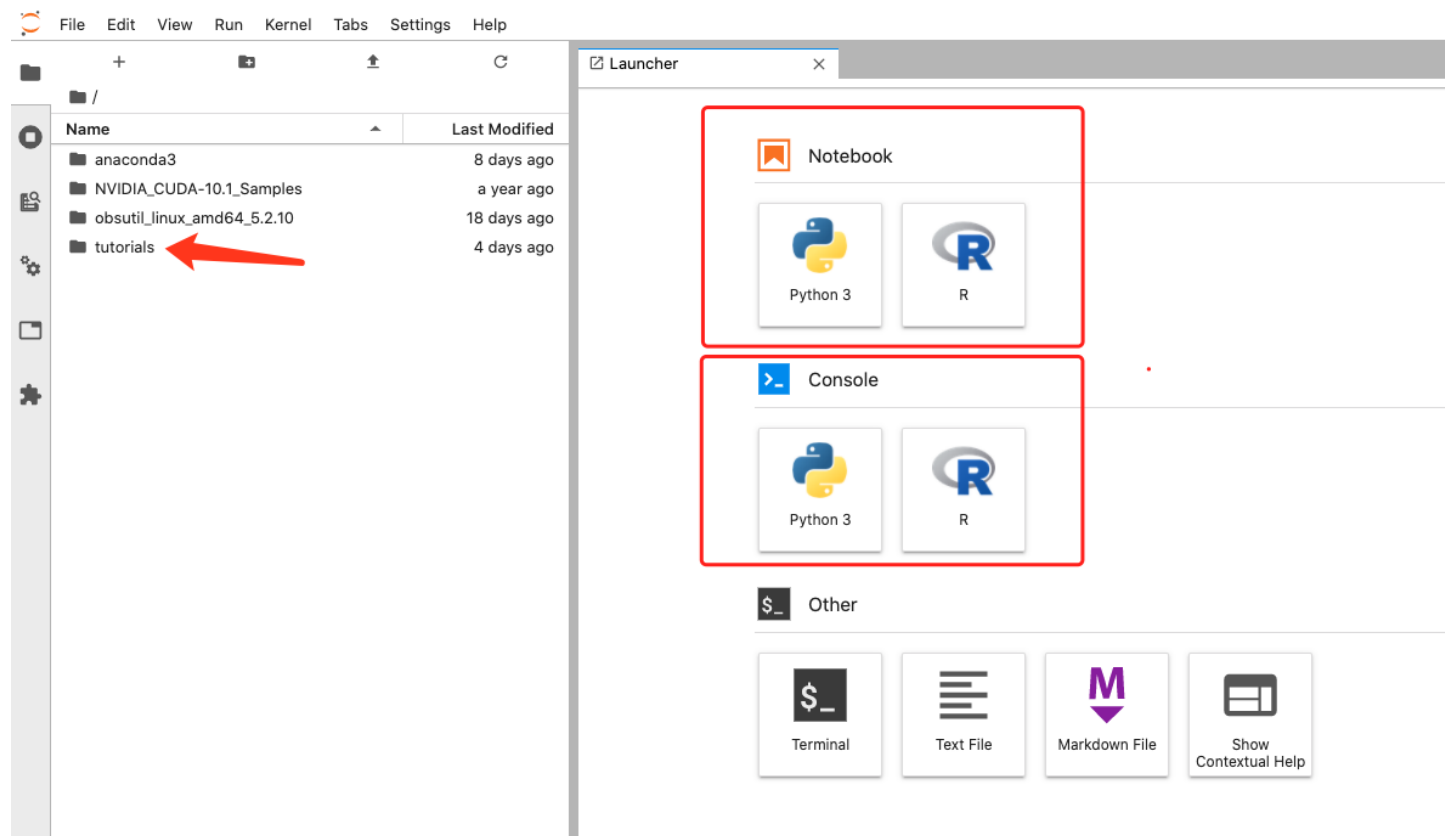
Elastic Cloud Server (ECS)

- Access via SSH
 - `ssh root@your_ECS_EIP`
- Username: root
- Password of your team's ECS will be given via MS Teams

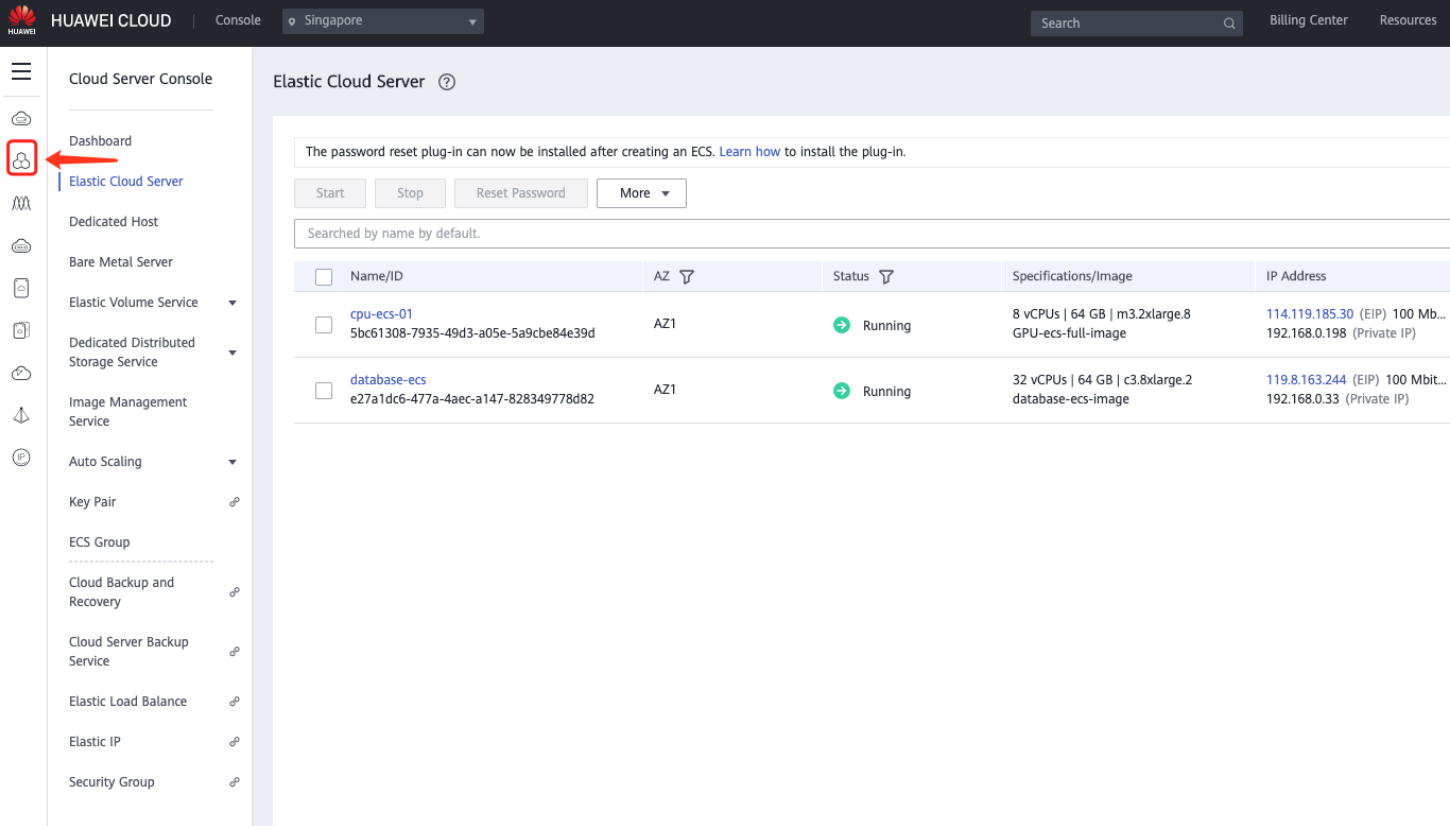
Elastic Cloud Server (ECS)

- Default virtual environment: conda_env
- Installed packages:
 - Anaconda packages, PyTorch 1.7.0, TensorFlow 2.3.1
 - Feel free to install more packages that you need
- To use Jupyter Lab (Python and R), do the following:
 - On the ECS terminal:
 - Just one of the team members do:
 - run “tmux”, enter tmux session
 - run “jupyter lab --no-browser --allow-root”, start jupyter lab server
 - Copy the token and save it somewhere for later use
 - press ctrl+b, then press d, back to main screen
 - On your own laptop’s terminal
 - run “ssh -f -L 8888:localhost:8888 root@your ECS EIP -N”
 - Change to 8123:localhost:8888 to use local 8123 port if your local computer has port 8888 occupied
 - Go to your browser, type url “localhost:8888/lab/workspaces/<ID>”, enter
 - ID should be unique for each user in your team, you can set your own ID
 - e.g. localhost:8888/lab/workspaces/batman, localhost:8888/lab/workspaces/spiderman

Remote Jupyter Lab



Relational Database Service (RDS)



The screenshot shows the Huawei Cloud console interface. The top navigation bar includes the Huawei Cloud logo, the word "Console", a region selector set to "Singapore", a search bar, and links to "Billing Center" and "Resources".

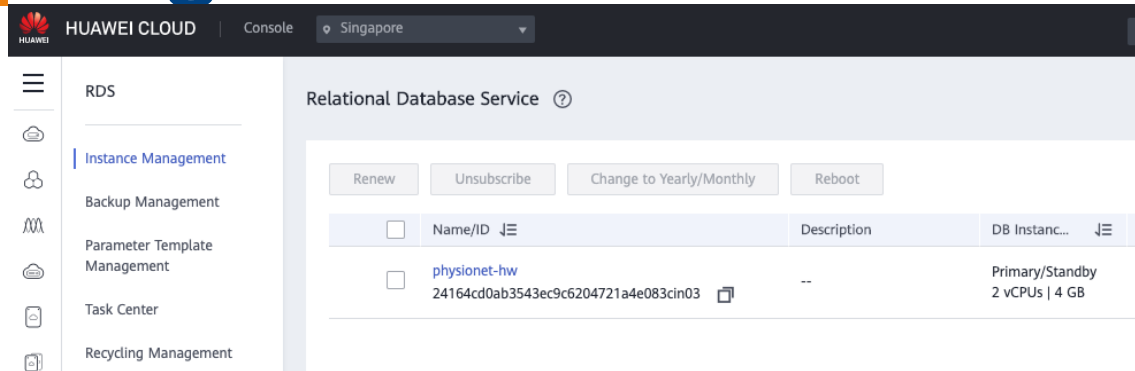
The left sidebar, titled "Cloud Server Console", contains a navigation menu. The "Elastic Cloud Server" option is highlighted with a red box and a red arrow pointing to it. Other options in the menu include Dashboard, Dedicated Host, Bare Metal Server, Elastic Volume Service, Dedicated Distributed Storage Service, Image Management Service, Auto Scaling, Key Pair, ECS Group, Cloud Backup and Recovery, Cloud Server Backup Service, Elastic Load Balance, Elastic IP, and Security Group.

The main content area is titled "Elastic Cloud Server" and displays a message: "The password reset plug-in can now be installed after creating an ECS. [Learn how](#) to install the plug-in." Below this message are buttons for "Start", "Stop", "Reset Password", and a "More" dropdown menu.

Below the buttons is a search bar with the text "Searched by name by default." and a table listing ECS instances. The table has columns for Name/ID, AZ, Status, Specifications/Image, and IP Address.

<input type="checkbox"/>	Name/ID	AZ	Status	Specifications/Image	IP Address
<input type="checkbox"/>	cpu-ecs-01 5bc61308-7935-49d3-a05e-5a9cbe84e39d	AZ1	Running	8 vCPUs 64 GB m3.xlarge.8 GPU-ecs-full-image	114.119.185.30 (EIP) 100 Mb... 192.168.0.198 (Private IP)
<input type="checkbox"/>	database-ecs e27a1dc6-477a-4aec-a147-828349778d82	AZ1	Running	32 vCPUs 64 GB c3.xlarge.2 database-ecs-image	119.8.163.244 (EIP) 100 Mbit... 192.168.0.33 (Private IP)

Log in to RDS



Instance Login Information

DB Instance Name	physionet-hw	DB Engine Version	PostgreSQL 9.5
------------------	--------------	-------------------	----------------

* Login Username

* Database Name

* Password ✔ Connection is successful.

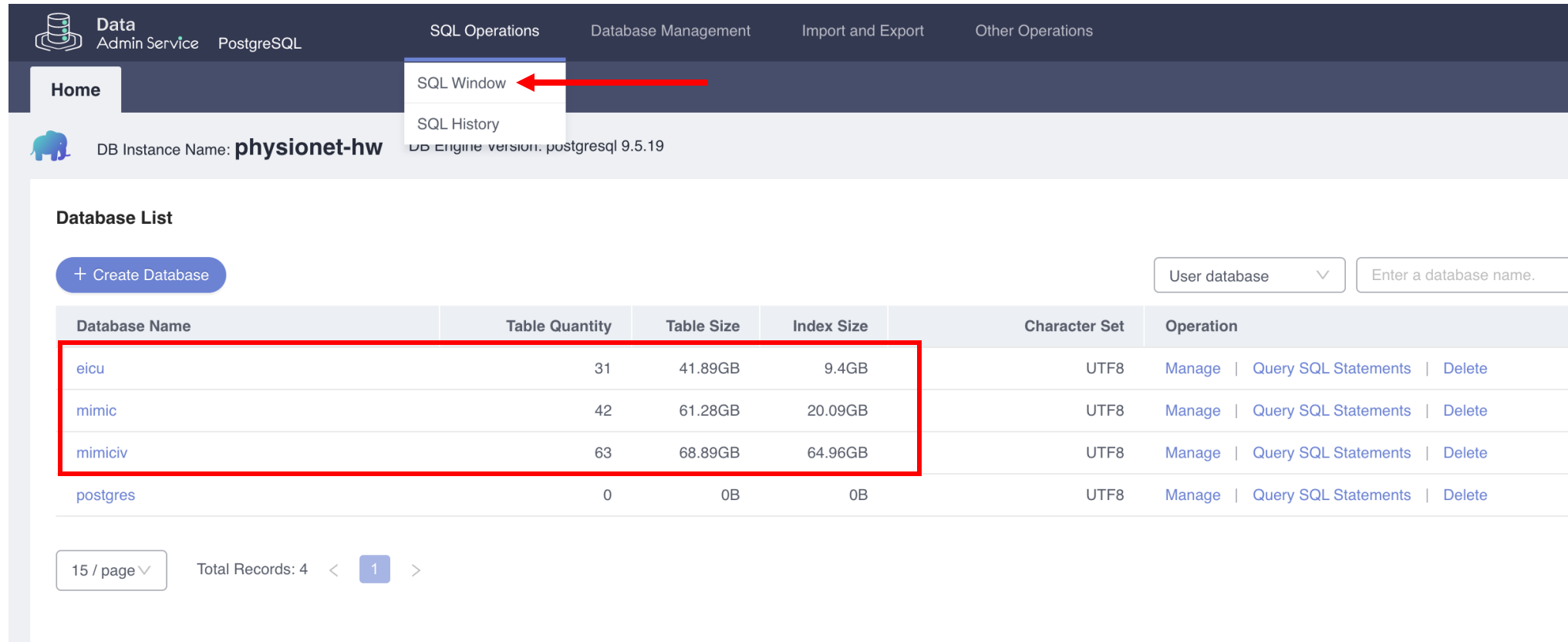
☒ Remember Password Select to remember your password in an encrypted form. Otherwise, the metadata collection function cannot be enabled.

Collect Metadata ☒ Periodically If not enabled, DAS can query the real-time structure information only from databases, which may affect the real-time performance of databases.

Show Executed SQL Statements ☒ If not enabled, the executed SQL statements cannot be viewed, and you need to input each SQL statement manually.

- Username: teamxx, e.g. team01
- Password of your team will be given via MS Teams

Data Admin Service (DAS)



The screenshot displays the Data Admin Service (DAS) interface. At the top, there is a navigation bar with tabs: Home, SQL Operations, Database Management, Import and Export, and Other Operations. The 'SQL Operations' tab is active, and a dropdown menu is open, showing 'SQL Window' and 'SQL History'. A red arrow points to the 'SQL Window' option. Below the navigation bar, the DB Instance Name is 'physionet-hw' and the DB Engine version is 'postgresql 9.5.19'. The main section is titled 'Database List' and contains a '+ Create Database' button, a 'User database' dropdown, and a text input field for 'Enter a database name.'. Below this is a table listing databases. The first three rows (eicu, mimic, mimiciv) are highlighted with a red box. The table has columns: Database Name, Table Quantity, Table Size, Index Size, Character Set, and Operation. The 'Operation' column contains links for 'Manage', 'Query SQL Statements', and 'Delete'.

Database Name	Table Quantity	Table Size	Index Size	Character Set	Operation
eicu	31	41.89GB	9.4GB	UTF8	Manage Query SQL Statements Delete
mimic	42	61.28GB	20.09GB	UTF8	Manage Query SQL Statements Delete
mimiciv	63	68.89GB	64.96GB	UTF8	Manage Query SQL Statements Delete
postgres	0	0B	0B	UTF8	Manage Query SQL Statements Delete

15 / page ▾ Total Records: 4 < 1 >

Data Admin Service (DAS)

The screenshot displays the Data Admin Service (DAS) interface. The top navigation bar includes links for Home, SQL Window, and various database management functions. The current database is set to 'eicu' and the schema is 'eicu_crd'. A red annotation 'Change database and schema here' points to the database and schema dropdowns. The left sidebar lists various tables and views, with a search bar. The main area shows a SQL query window with the text 'Write your query here' and a button to 'Execute SQL (F8)'. Below the query window, the 'Result Set 1' tab is active, displaying the execution result of the query 'SELECT * FROM allergy limit 5'. The result is a table with 8 columns: allergyid, patientunitst..., allergyoffset, allergyentere..., allergynotetype, specialtytype, and userty. The table contains 5 rows of data. A warning message states: 'This object has no primary key and cannot be edited or exported in SC'. The bottom of the interface shows a pagination control indicating 'Display at most 50 rows'.

Database: Schema:

Execute SQL (F8) Format SQL (F9) Execute SQL Plan (F6) SQL Favorites

1 `SELECT * FROM allergy limit 5`

Write your query here

Executed SQL Statements Messages Result Set 1

The following is the execution result set of SELECT * FROM allergy limit 5. ⚠ This object has no primary key and cannot be edited or exported in SC

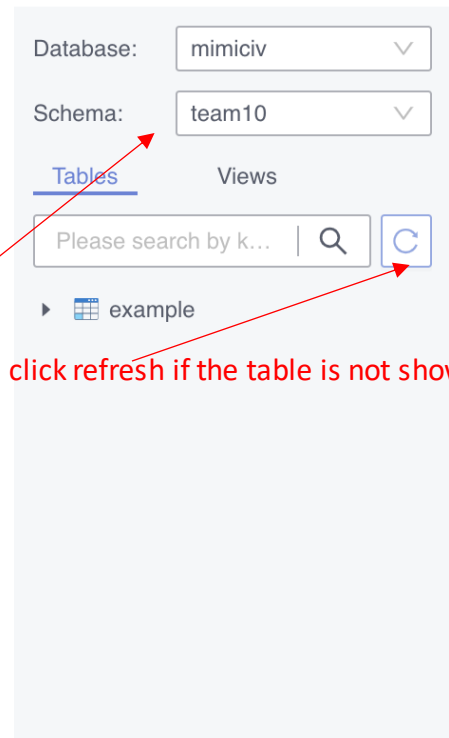
	allergyid	patientunitst...	allergyoffset	allergyentere...	allergynotetype	specialtytype	userty
1	378178	242070	3	3	Daily Progress	eCM Primary	Other
2	298537	242070	23	63	Admission	eCM Primary	THC N
3	378177	242070	3	3	Daily Progress	eCM Primary	Other
4	298536	242070	23	63	Admission	eCM Primary	THC N
5	385834	242083	1316	1319	Comprehensive Pr...	eCM Primary	THC N

Display at most 50 rows

Create tables

- You might want to store your intermediate results in a table

3. Go to your team's schema, click refresh if the table is not shown



Database: mimiciv

Schema: team10

Tables Views

Please search by k... | Q

▶ example

Execute SQL (F8) Format SQL (F9) Execute SQL Pla

```
1 create table team10.example as
2 (
3 SELECT * FROM mimic_core.admissions limit 10
4 )
```

1. Write your query as "create table <table_name> as (your table query)"

Executed SQL Statements Messages

-----Execute-----

[Split SQL] Number of SQL(s) to be executed: 1

[Executed SQL: (1)]

create table team10.example as

(

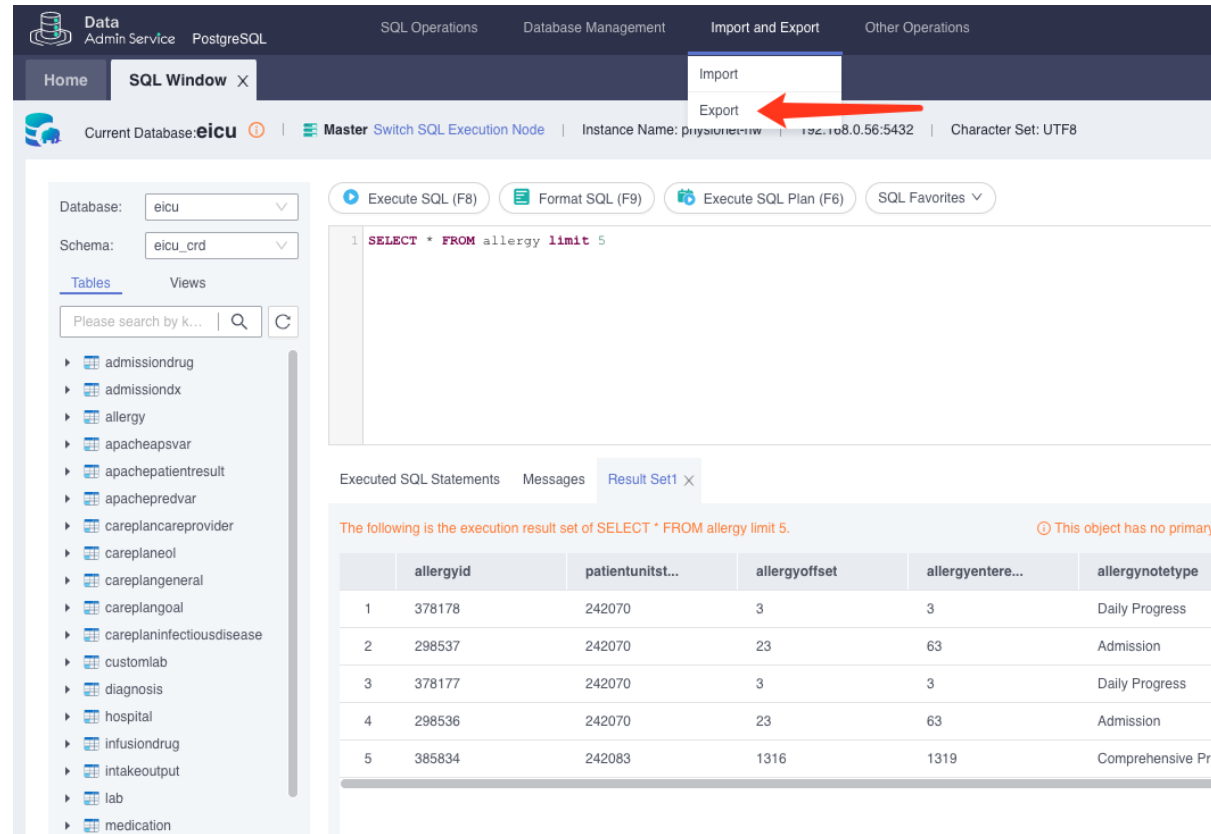
SELECT * FROM mimic_core.admissions limit 10

)

executed successfully. Time required: [9ms.]

2. See the success message

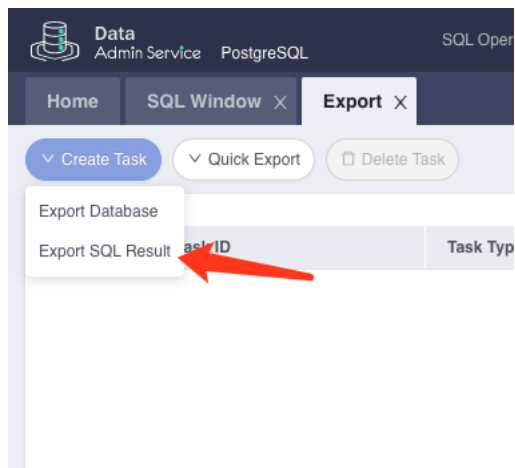
Export results to local CSV



The screenshot shows the Data Admin Service PostgreSQL interface. The top navigation bar includes 'Data Admin Service', 'PostgreSQL', 'SQL Operations', 'Database Management', 'Import and Export', and 'Other Operations'. The 'Import and Export' menu is open, with a red arrow pointing to the 'Export' option. The 'SQL Window' tab is active, showing a SQL query: `1 SELECT * FROM allergy limit 5`. The left sidebar displays a list of tables under the 'eicu' database and 'eicu_ord' schema, including 'admissiondrug', 'admissiondx', 'allergy', 'apacheapsvar', 'apachepatientresult', 'apachepredvar', 'careplancareprovider', 'careplaneol', 'careplangeneral', 'careplangoal', 'careplaninfectiousdisease', 'customlab', 'diagnosis', 'hospital', 'infusiondrug', 'intakeoutput', 'lab', and 'medication'. The 'Result Set 1' tab is selected, showing the execution result of the SQL statement. A warning message states: 'The following is the execution result set of SELECT * FROM allergy limit 5. This object has no primary'. The result set is displayed as a table with 5 rows and 6 columns: 'allergyid', 'patientunitst...', 'allergyoffset', 'allergyentere...', and 'allergynotetype'.

	allergyid	patientunitst...	allergyoffset	allergyentere...	allergynotetype
1	378178	242070	3	3	Daily Progress
2	298537	242070	23	63	Admission
3	378177	242070	3	3	Daily Progress
4	298536	242070	23	63	Admission
5	385834	242083	1316	1319	Comprehensive Pr.

Export results to local CSV




Export SQL Result

Basic Information

Database	eicu change database here
Allowed Rows	Unlimited
File Type	<input type="radio"/> SQL-Insert <input checked="" type="radio"/> CSV
Charset	<input checked="" type="radio"/> UTF8 <input type="radio"/> GBK
Storage ?	<input checked="" type="radio"/> query-results No OBS bucket? Create Bucket <small>Creating an OBS bucket is free of charge, but storing files in it will incur fees.</small>
Options	<input checked="" type="checkbox"/> Include Attributes <input type="checkbox"/> Generate one file for each result.
SQL to Execute	<pre>SELECT * FROM "eicu_crd"."admissiondrug"</pre> <p>paste your query here</p>
Remarks	

Advanced Settings

Download the result

 **Data**
Admin Service PostgreSQL

SQL OperationsDatabase ManagementImport and ExportOther Operations

SG-Datathon-20

HomeExport X

▼ Create Task

▼ Quick Export

🗑 Delete Task

Time Range:

Start Date📅

End Date📅

Search🔍

<input type="checkbox"/>	Task ID	Task Type	Database	Started	Ended	File Size	File Type	Status	Elapsed Tim	Exported Ro	Progress	Remarks	Operation
<input type="checkbox"/>	87c62144b71b4094862144...	SQLResult	eicu	2020-11-30 14:15:20	2020-11-30 14:15:20	599 B	CSV	✓ Succes...	Within 1s	10	<div></div> 100%		Details Download



Suggestions

- SQL window
 - Explore the database and polish your query
- Export window
 - Copy the finished query and paste here



Accessing the databases via local connection

- Locally / pgAdmin / etc.
 - host = 119.8.167.24
 - port = 5432
 - username = teamxx, e.g. team01
 - password = given via MS Teams

Object Storage Service (OBS)

- For medical imaging teams: see all the available datasets

```
(conda_env) root@cpu-ecs-01:~# obsutil ls obs://datathon
Start at 2020-11-21 14:30:37.16038972 +0000 UTC

Listing objects .

Folder list:
obs://datathon/BraTS/
obs://datathon/CheXpert/
obs://datathon/ChestX-ray8/
obs://datathon/ChestX-ray8/ChestX-ray8/
obs://datathon/EMIDEC/
obs://datathon/HECKTOR challenge/
obs://datathon/MedicalSegmentationDecathlon/
obs://datathon/MedicalSegmentationDecathlon/MedicalSegmentation/
obs://datathon/RibFrac Dataset/
obs://datathon/VerSe2019/
obs://datathon/VerSe2020/
obs://datathon/autoimplant/
```

Object Storage Service (OBS)

- More about OBS: Check the OBS README

📁 / tutorials /

Name ▲	Last Modified
• 📄 EHR Database Connection - Python.ipynb	4 days ago
• 📄 EHR Database Connection - R.ipynb	4 days ago
📄 Huawei Cloud - OBS.md	5 days ago



Q&A

- If you have any questions, please feel free to contact me via MS Teams