SAP is supplying the database technology for this event.

This new technology is called HANA and you can read more about it here: http://www.saphana.com/welcome (our event is mentioned on this page)

In particular the event is using HANA One which is the database and associated analytical tools running on the Amazon cloud (AWS)

HANA is an in-memory column-oriented (column-row hybrid) database which supports very fast analysis of large datasets and is integrated with R

SAP may make the MIMIC II AWS instance available on demand in the near future. If you are interested send mail to: john.ellenberger@sap.com and we will follow-up

Many instructional videos are available at the SAP HANA Academy: http://www.saphana.com/community/hana-academy
First Register with qwikLAB

One person from each team needs to send us their email contact and then that person registers with qiklab for an account.

Please go to the following URL and set-up an account:

http://try.qwikLab.com

Then click on the link as show to the right to start-up your environment…
Once the instances have started....

*Wait Patiently for Amazon instance to start...*

You will be presented with the following:

- The IP address of a windows desktop preconfigured for you
- The IP database server/Linux instance

The system should maintain this info for you *but it's would be a good idea to make a note of it!*
After Your Instances Start up...

You have several different styles of working now that your workspace has been create for you.

The HANA DB has been preloaded with the MIMIC II data and the windows desktop is set to point to the DB server so you don’t have to configure any software locally if you wish.

There are several ways to use this setup:

- **Supported/Recommended:** Login via RDP to the Windows desktop. All the necessary tools are installed and ready for you to work on.
- **Supported:** Install the eclipse-based HANA Studio on your local machine and work there.
- **May Work:** SSH to the HANA DB server and work on command line.

*These directions will explain each of these options further...*
Windows Desktop Access

You will be given the IP address of a Windows desktop that has your database console and a few other analytical tools installed. There is even an SSH client and key to access the database machine.

You access this Windows instance via RDP client

Popular RDP clients are:

- **Windows** computers: Microsoft Remote Desktop (also available for Apple computers and phones)
- **Macintosh** computers: either the Microsoft client, CoRD, 2X for Mac, which you can find on iTunes
- **Linux** many options. Many distributions include an RDP client as part of the base distribution
- **Thin RDP**: Point a browser at https://<windows ip>

Your user account on this Windows box will be **User01** with a password of **4262Hana**

**NOTE:** Cutting and Pasting sometimes works incorrectly so you may have fix things in the SQL editor if you a syntax error and you think the syntax is correct
Alternative: Install Eclipse Client on Your Local Desktop

A alternative to using the remote desktop is to install the Eclipse client on your machine.

You will find the “Studio” client software at the following URL: https://hanadeveditionsapic1.hana.ondemand.com/hanadevedition/ under the HANA Studio tab. Linux, Mac and Windows are supported.

Except for Macintosh you may want to also install the “client” software which is a collection of drivers (ODBC) and some utilities.

The documentation for installing software can be found here:


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Command Line Access (SSH)

Command line access is provided mainly for miscellaneous tasks peripheral to database development. This is preconfigured on the windows desktop. If you chose to connect from your computer you need to request the access keys which we can send via email.

The instance is running SUSE Enterprise Linux 11.1

You will be given two Amazon keys for command line access: a private key for use with non-Windows clients and a PuTTY version of the same key for users of the PuTTY client.

The username is root with no password (standard AWS instance)

There is a command line version of R installed as well as some of the HANA client software (including ODBC drivers)

The “scratch” area for data is: /backup/download (?)

PLEASE BE CAREFUL: You are logged on as root!
Configuring a Local Eclipse Client--Step 1

This is not necessary if you are using the RDP/Windows Desktop instance...

*Please note that it takes the system about 5 minutes to be available on the network (after the instance start)*

When the HANAStudio is running you should have an empty “explorer” to the left

Right click and select “Add System” and you will get the dialog box shown here

Enter the IP-address you have been given, and Instance Number of “00” and whatever description you choose
Configuring the Client--Step 2

Press next and you should see the “login” panel shown here
Enter: **SYSTEM** for your username
Enter: **4262Hana** for your password
Or ...
Enter: **DEMOUSER1** for your username
Enter: **4262Hana** for your password

At this point you should see a picture of a database with a little green light

If this is not the case try going through the process a 2nd time in case you mistyped a password

If this also fails please contact us for help
Working with HANA Studio

You will want to select the SAP HANA Development aspect (sp?) in the upper right menu.

To work with SQL press the small SQL button (circled in picture) and a new SQL window will appear with a tab to the right.

You can have multiple SQL Windows (tabbed) active at once.

You can browse the database by selecting the “Catalog” tab in the explorer pane.

Right click to view data in table, etc.
Working with HANA SQL

The HANA database uses standard SQL syntax

It is fairly strict about syntax and has fewer extensions than some databases

The SQL manual can be found at: http://help.sap.com/hana/SAP_HANA_SQL_and_System_Views_Reference_en.pdf

We have also translated the MIMICII cookbook to HANA syntax as examples:

http://goo.gl/2QTTGa

A Quick Example:

Expand the “Catalog”, and Right-click on the “DEMOUSER1” schema, and click to open up a new “SQL Console”.

Then, enter the following SQL to copy all the data of icustay_detail to a new table called “test_table”.

```sql
CREATE TABLE test_table AS
(SELECT * FROM "M IM IC 2 V 26 "."icustay_detail");
```

After the above SQL runs successfully:

Right-click on the “Tables” folder/group under the “DEMOUSER1” schema, and click to “Refresh” the list of tables.

You should now see the newly created table, called “test_table” in the list.
Export Catalog Objects To CSV

Let us now watch how to export a catalog object to a CSV file.

We will export the TEST_TABLE object that we recently created in the previous example.

- **Right-Click** on the table that you want to export. Here, we right-click on the “TEST_TABLE” object under the “DEMOUSER1” schema.

- **Click** “Export…”

- In the Export Wizard, TEST_TABLE will automatically be selected.

- **Click** “Next” to continue.
Export Catalog Objects To CSV (cont’d)

- Select “CSV” as the Column Table Format.
- Make Sure “Including Data” is selected.

For Server-Side Export:
- Select “Export Catalog Objects on Server”
- Enter the server-side path to save the CSV file. Here, we enter:
  /backup/downloads/csv/

For Client-Side Export:
- Select “Export Catalog Objects to Current Client”
- Enter your desktop path to save the CSV file.

- Click “Finish”.

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SAP HANA with R Integration

The SAP HANA database allows you to send data back and forth to R for further processing.

You communicate with R by constructing tables that represent R “data frames.”

The example here is a very simple example of usage.

More detailed examples can be found in the manual: http://help.sap.com/hana/SAP_HANA_R_Integration_Guide_en.pdf:

```
--#prepare tables
DROP TABLE PRIME;
CREATE TABLE PRIME(NUMBER INTEGER);

INSERT INTO PRIME VALUES (2);
INSERT INTO PRIME VALUES (3);
INSERT INTO PRIME VALUES (5);
INSERT INTO PRIME VALUES (7);
INSERT INTO PRIME VALUES (11);
INSERT INTO PRIME VALUES (13);
INSERT INTO PRIME VALUES (19);

DROP TABLE PRIME_SQR;
CREATE TABLE PRIME_SQR(NUMBER INTEGER);

--#create SQL-script function including R script
DROP PROCEDURE my_f;
CREATE PROCEDURE my_f(IN input1 PRIME, OUT result PRIME_SQR)
LANGUAGE RLANG AS
BEGIN
result <- as.data.frame(input1$NUMBER^2);
names(result) <- c("NUMBER");
END;

--#execute SQL-script function and retrieve result
CALL my_f (PRIME, PRIME_SQR) WITH OVERVIEW;
SELECT * FROM PRIME_SQR;
```

In this simple example the R script does not do much. It just calculates the power of two for a single Column named "NUMBER".
Optional (for the adventurous)

You can add the SYSTEM account to your HANA access but BE CAREFUL. The username is **SYSTEM** and the password is: **4262Hana**