COSC 416: Topics in Databases (DBaaS)

TOPIC 8: MICROSOFT AZURE SQL

SCHEDULE

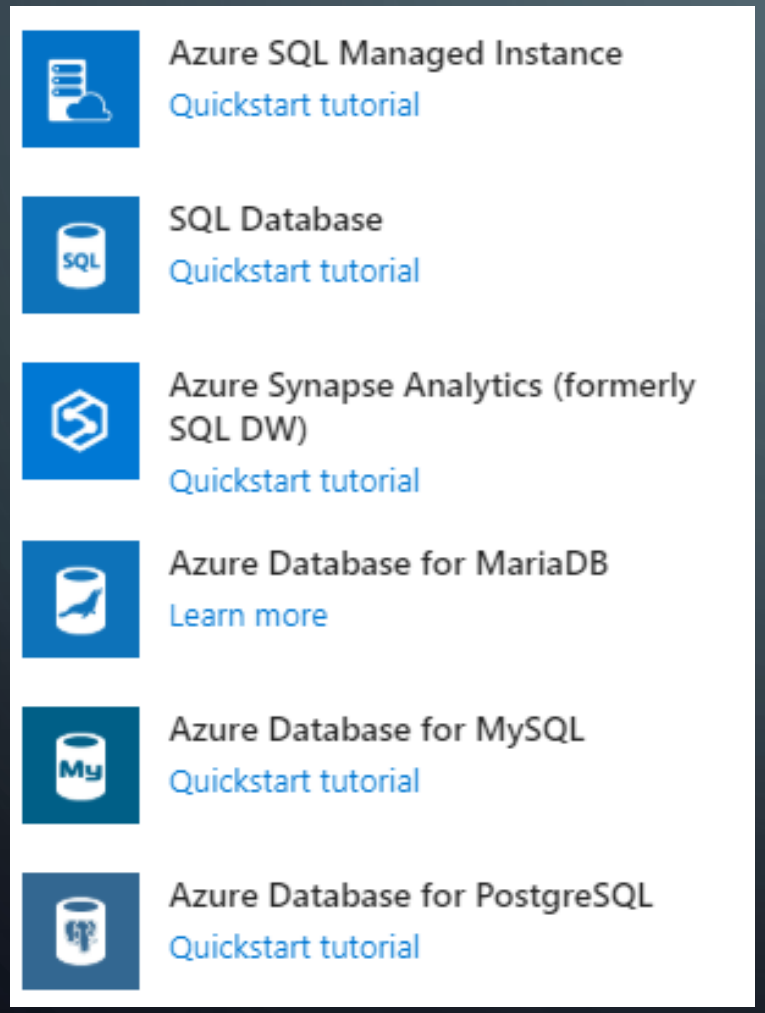
1. *Intro to Microsoft Azure*
2. *Announcements:*
    1. *Lab, today and upcoming*
    2. *Quiz #1*

INTRO TO MICROSOFT AZURE SQL

THE MICROSOFT ALTERNATIVE

- So we've looked at Amazon's relational DBaaS offerings – but what about the competitor's offerings?
- Enter *Microsoft Azure*, which offers a number of relational, managed cloud databases
- Like Amazon AWS, Microsoft Azure is a broader cloud computing platform that also offers a variety of server and cloud services

DATABASE MANAGEMENT OPTIONS



- Microsoft Azure offers a variety of relational database products, ranging from actual virtual machines with OS-access (*not a DBaaS*) to fully managed, elastic database solutions

AZURE SQL

- The premier DBaaS product offered by Microsoft is the Azure SQL service
- This is a fully managed SQL database service with broad advertised compatibility with other SQL database engines
- Azure SQL offers multiple deployment options: managed instances, single databases, and elastic pools

AZURE SQL – UNDERLYING DETAILS

- Azure SQL instances run *Microsoft SQL Server* (MSSQL), which is commonly used in enterprise applications
  - Unlike engines like PostgreSQL and MySQL, MSSQL is an enterprise application and costs $$$ to license
- Managed instances are simply MSSQL instances with the OS/hardware/dependencies managed for us, while single databases are fully isolated, with the actual MSSQL management being done for us

AZURE SQL – ELASTIC POOLS

- A rather interesting implementation of Azure SQL is the *elastic pool*
- An elastic pool is a collection of single databases (not managed instances), but using a shared pool of resources (CPU, memory, etc)
- Allows databases to be freely moved into and out of the pool, allowing more efficient use of resources depending on circumstances (add to pool when underutilized?)

PRICING OF AZURE SQL

- Sadly, Azure SQL is not offered as part of the free trial that you can get with Microsoft Azure
- Azure will not let you create an Azure SQL instance when in “Free trial” mode
- This is likely due to the fact that MSSQL is licensed software, and Microsoft doesn’t feel like giving people free access to software that otherwise requires a paid license to use

THE GOOD NEWS

- The good news is that we have other options in Azure which are available to free trial accounts, namely managed (free) DBMS's
- Azure offers:
  - Azure Database for MariaDB
  - Azure Database for MySQL
  - Azure Database for PostgreSQL

AZURE'S PRICING MODEL

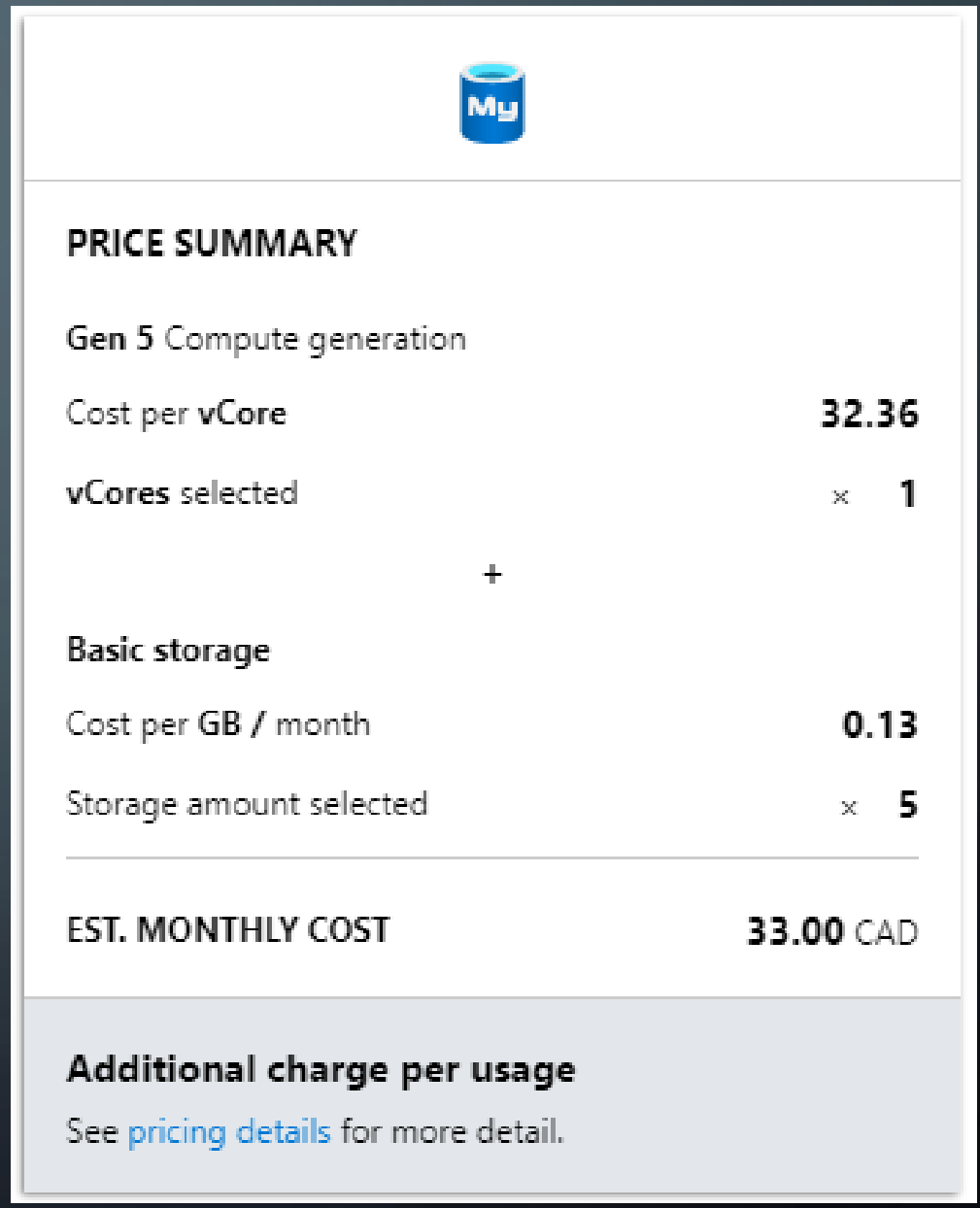
- Azure uses a rather complex model for choosing resources and pricing of it's services
- Two distinct models: vCore and Database Transaction Unit (DTU)
- vCore is used primarily for managed instances, while single databases and elastic pools can use DTUs

VCORE VS DTU

- The major difference between the vCore and DTU units is scalability and transparency
- With vCore, you have an idea of how much RAM and CPU you have/want for your server, and can price out storage and computing power separately
- With DTU, a blended metric is used that combines RAM, CPU, and I/O speed, with pricing being based entirely on DTUs (no separation of storage and computation costs)

WHAT WE'LL BE USING

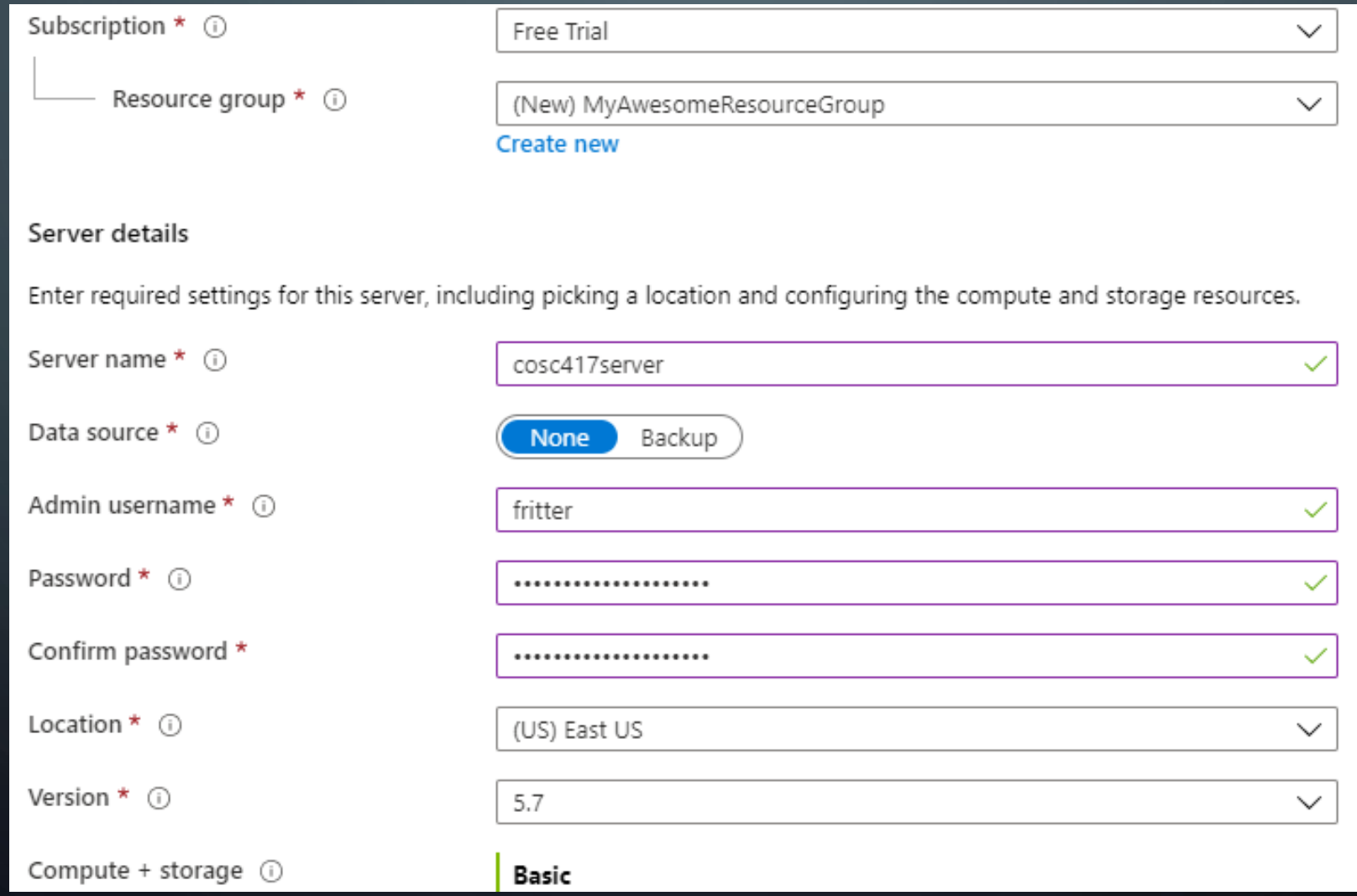
- We will be primarily working with vCores – DTUs are primarily used for elastic (scalable) instances, while vCores are more similar to what we've seen in Amazon AWS
- Be careful of the pricing!



CREATING A MYSQL SERVER

- Luckily, we can create Azure Database for MySQL/MariaDB/PostgreSQL instances on our trial account
- This is a relatively straightforward process, and you'll find that the interface is fairly similar to that used in AWS when creating a new database instance

CREATING A MYSQL SERVER



A NOTE ON AUTO-GROWTH STORAGE

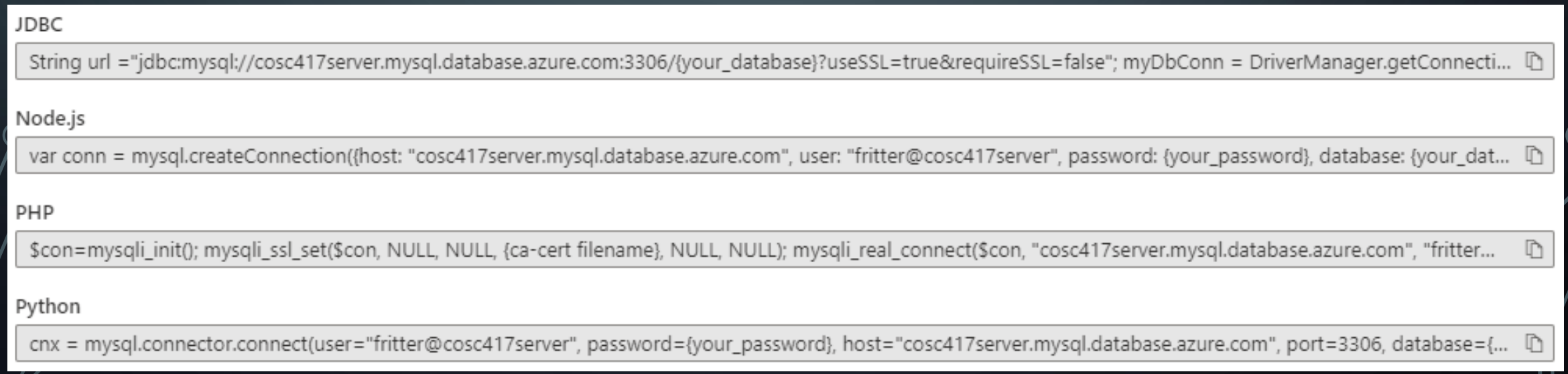
- One feature you need to be careful of is Azure's auto-growth storage
- This option can be selected when creating a new database instance
- Every time free storage drops below 5%, Azure will automatically increase storage by 5% (or 10% for smaller servers)
- A handy feature for sure, but also a risky one → potential for accidental costs due to unchecked storage scaling, particularly in certain applications (long-term logging, for instance)

COMPARISON WITH AWS

- Azure offers many of the same features as AWS
- Azure offers a more flexible pricing schema, but also has a higher minimal buy-in price than AWS does in some cases
- If you want to use MSSQL for an enterprise application, Azure wins hands down
- Deployment times in general are faster for Azure (seemingly)

CONNECTING TO AN AZURE DATABASE INSTANCE

- Handily, under the "Connection strings" menu option of your newly-created instance, Azure gives you pre-populated connection strings



ANNOUNCEMENTS

LAB TODAY

- In the lab today, you should hopefully be finishing off your implementation of the AWS MySQL sandbox program
- The lab is due next Monday
- There is no new lab this week, but if you want to get a head start, pop on over to Azure, create a trial account, and try creating an Azure Database for MySQL instance

QUIZ #1

- Quiz #1 is scheduled for this Wednesday
- Topics covered will include general DBaaS architecture information, as well as specifics of the Amazon AWS DBaaS platform
- Topics will be posted tonight
- There will be a practical component to the quiz, requiring you to create a new database instance using Amazon AWS (and configure it to allow remote access for the testing script)

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SO LONG, FOLKS!