A decorative graphic on the left side of the slide, consisting of a network of white lines and small circles on a dark blue background, resembling a circuit board or a neural network.

COSC 416: Topics in Databases (DBaaS)

TOPIC 1: COURSE INTRO

SCHEDULE

- 1. Syllabus – Topics, Grading, Miscellany*
- 2. Entry Questionnaire*
- 3. What is DBaaS?*

SYLLABUS – COURSE OVERVIEW

- In this course, we're going to be exploring Database-As-A-Service systems
- How they work, why you should (or shouldn't) use them, and the major commercial DBaaS products available
- Lots of hands-on work for this course setting up and tearing down DBaaS systems

SYLLABUS – PREREQUISITES

- This course has a prerequisite of third-year standing and a minimum of 60% in COSC 304
- I'm willing to waive these prerequisites if needed, but you should definitely have at least *some* experience with databases for this course

SYLLABUS – COURSE MATERIALS

- As with my previous courses, there is no textbook or other required literature for this course
- All course content, including slides, labs, and other materials (study guides, important readings, etc) will be available through Moodle and GitHub

SYLLABUS – DBAAS'S COVERED

- Amazon Relational Database Service (RDS)
- Amazon DynamoDB (NoSQL value-store)
- Microsoft Azure
 - SQL, MySQL, PostgreSQL variants
- Google Cloud and Google BigQuery
- Potentially MongoDB Atlas, Amazon DocumentDB

SYLLABUS – TENTATIVE SCHEDULE

- Topics/dates listed are tentative
- Quiz 1 will be some time in early February,
Quiz 2 will be some time in early March
- Study break Feb 17–21
- Possibly some time at the end for a TBD topic


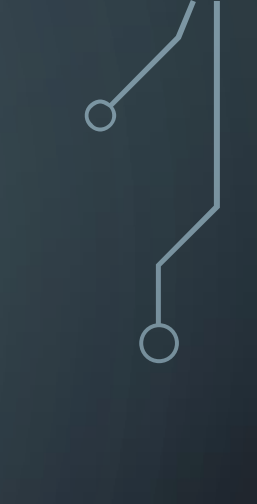
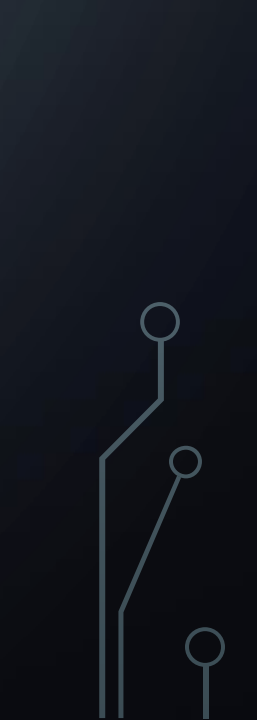
SYLLABUS – GRADING SCHEMA

- Most labs will be two weeks (possibly 3), more like mini-projects
- 6 Labs worth 40% of the total grade
- 2 in-class quizzes worth 15% each (30% total)
- Final exam is worth 30%
- Possibility of practical test components (TBD)



SYLLABUS

Any Questions?

- Prereqs
 - Grading
 - Labs
 - Scheduling
 - Topics
- 
- 
- 

ENTRY QUESTIONNAIRE

ENTRY QUESTIONNAIRE

- I have a small questionnaire for everyone to fill out
- This will hopefully give me a better understanding of what you know, and what you want to learn
- Your chance to help shape the curriculum a bit, suggest possible bonus topics that you'd like to see covered

WHAT IS DBAAS?

SOFTWARE AS A SERVICE (SAAS)

- Database-As-A-Service is part of a greater trend of Software-As-A-Service software models
- Consider old-school software products: you bought a disk (or a download), installed it, and ran it on your machine (e.g. Steam games, old MS Office and Adobe products, etc)

BUT WHY DO IT YOURSELF?

- Nowadays, more and more software is offered as a *service*, rather than a *product*
- You buy or rent the service, which is installed and run from centralized machines in the cloud, with data streamed back and forth between clients (you) and the central server

UPSIDES AND DOWNSIDES

- There are a lot of upsides and downsides to the service software model
 - Can be cheaper than buying software outright
 - Usually more scalable due to centralization of resources
 - Less control in many cases versus a local installation
 - Often maintained for you, no need to manually patch or watch uptime
 - Possibly worse for consumers in terms of outright ownership of the product versus licensing of the service (this is a fun one)

FROM SAAS COMES DBAAS

- What happens when you offer Database Management Software (DBMS) as a service over the internet?
- You get a Database-As-A-Service system
- Hassle-free, one-click scalable databases on massive cloud networks (at least, that's the dream)

THE MAJOR DIFFERENCE

- With a traditional database, you'd be running the database server yourself on a dedicated machine, or locally on a shared server (say, alongside a web application)
- In a DBaaS application, you basically rent a database from a provider (Amazon, Microsoft, Google), and pay based on your usage

WORKING WITH A DBAAS

- DBaaS systems offer a means of communication with the database (API, SQL, NoSQL, etc), as well as APIs to control the database(s) themselves
- This API is important: allows you to add users, create new databases, scale databases, and perform other administration tasks dynamically via web commands

MAJOR PLAYERS IN THE DBAAS BUSINESS

- Amazon, Microsoft Azure, and Google all offer a number of DbaaS products, ranging from general-purpose to specialized solutions for specific tasks
- SQL and NoSQL based services, data warehousing services, etc

NEXT LECTURE

- On Wednesday we'll be digging into the actual structure of DBaaS systems and how we communicate with them
- Also, the major benefits and drawbacks inherent to DBaaS systems
- First system we'll look at: Amazon RDS

SCHEDULE

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The image features a dark blue gradient background with faint, stylized circuit board traces in the corners. These traces are composed of thin white lines and small circles, resembling electronic components or data paths. The central text is a large, white, sans-serif font that reads "SO LONG, FOLKS!".

SO LONG, FOLKS!