Security and Authentication

CS 240 - The University of Illinois

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Overview of Cloud Services (AWS)

https://aws.amazon.com/

Overview of Cloud Services (Others)

https://azure.microsoft.com/en-us/services/

https://cloud.google.com/products

Security and Authentication

Token-Based ("Bearer") Authorization

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What is a token?

Length	Combinations	Avg. Time to Find @ 1m guesses /sec
1	$62^1 = 62$	0.031 **ms**
2	$62^2 = 3{,}844$	1.9 **ms**
3		
4	$62^4 = 1{,}4776{,}336$	7.4 **seconds**
5	$62^5 = 916{,}132{,}832$	458 **seconds**
10	$62^{10} = 8.4 \times 10^{17}$	13 298 **years**
15	$62^{15} = 7.7 \times 10^{26}$	~12,182,899,300,000 **years**

1P061GTQYgMp0WOXqmJqh2ZzlK2AFZDPeJmWLWThtUlE

What happens when you lose a token?

What happens when you lose a token?

...does this make it insecure?

Token Storage

SQL Database: (Relational Datastore)	`CREATE INDEX UserToken` `ON tableUserTokens (token);`
MondoDB: (NoSQL Datastore)	`db.userTokens.createIndex(` `    { "token": 1 }, { unique: true })`
Redis (Memory Datastore)	*(Every key acts like an index.)*

Authorization vs. Authentication

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Tokens provide a form of authorization (access) to a specific resource, and are often used after a form of authentication (verification) is done.

Authentication as a Service

Ex: "Login with Google" / "Login with Instagram" / ...

Ex: Queue@Illinois ⇒ Login w/ Illinois

- Shibboleth (UIUC login technology) provides user authentication without revealing any details except that the user!

Authentication as a Service

Advantages:

Disadvantages:

Project MIX