AWS re:Invent

DAT301-R5

Data modeling with Amazon DynamoDB in 60 minutes

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AWS
re:Invent

aws

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DynamoDBGuide.com

DynamoDBBook.com

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Related breakouts

DAT325: Amazon DynamoDB: Under the hood of a hyperscale database

DAT403-R: Amazon DynamoDB deep dive: Advanced design patterns

CMY304: Data modeling with Amazon DynamoDB

What is Amazon DynamoDB?

AWS re:Invent

What is Amazon DynamoDB?

NoSQL database

Fully managed by AWS

HTTPS with AWS IAM auth
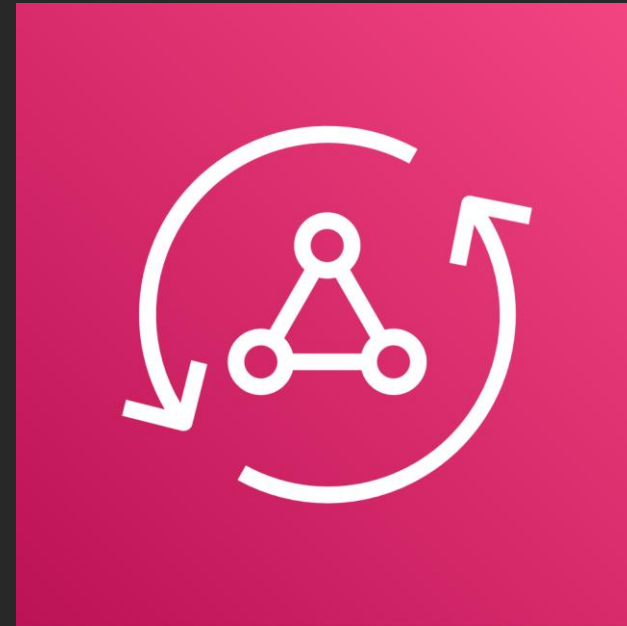
Fast, consistent performance as it scales

Hyper-scale

Hyper-ephemeral compute

AWS Lambda

AWS AppSync

Key concepts

aws

Concepts

- Table

- Item

- Primary key

- Attributes

Primary Key	Attributes		
SessionId			
01c1093b-7e54-4864-8d43-703e0fc1686b	**Username**	**CreatedAt**	**ExpiresAt**
	blackwidow	2019-05-02T22:09:08	2019-05-03T22:09:09
54ba2c29-d533-43f0-b7a6-114bcf2f003f	**Username**	**CreatedAt**	**ExpiresAt**
	thanos	2019-05-06T06:15:54	2019-05-07T06:15:54
f01fc912-5292-4ba1-821d-a1e05b42cdf9	**Username**	**CreatedAt**	**ExpiresAt**
	ironman	2019-04-26T20:38:18	2019-04-27T20:38:18
ed7d2e9e-699e-4f21-a8b4-96c607740d98	**Username**	**CreatedAt**	**ExpiresAt**
	blackpanther	2019-05-11T19:15:59	2019-05-12T19:15:59

Table

Primary Key	Attributes		
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01c1093b-7e54-4864-8d43-703e0fc1686b	blackwidow	2019-05-02T22:09:08	2019-05-03T22:09:09
	Username	**CreatedAt**	**ExpiresAt**
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Item

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f01fc912-5292-4ba1-821d-a1e05b42cdf9	Username	CreatedAt	ExpiresAt
	ironman	2019-04-26T20:38:18	2019-04-27T20:38:18
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	blackpanther	2019-05-11T19:15:59	2019-05-12T19:15:59

Attributes

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	blackpanther	2019-05-11T19:15:59	2019-05-12T19:15:59

Primary key

- Simple primary key (*partition key*)

- Composite primary key (*partition key* + *sort key*)

Simple primary key

Primary Key	Attributes		
SessionId			
	Username	**CreatedAt**	**ExpiresAt**
01c1093b-7e54-4864-8d43-703e0fc1686b	blackwidow	2019-05-02T22:09:08	2019-05-03T22:09:09
	Username	**CreatedAt**	**ExpiresAt**
54ba2c29-d533-43f0-b7a6-114bcf2f003f	thanos	2019-05-06T06:15:54	2019-05-07T06:15:54
	Username	**CreatedAt**	**ExpiresAt**
f01fc912-5292-4ba1-821d-a1e05b42cdf9	ironman	2019-04-26T20:38:18	2019-04-27T20:38:18
	Username	**CreatedAt**	**ExpiresAt**
ed7d2e9e-699e-4f21-a8b4-96c607740d98	blackpanther	2019-05-11T19:15:59	2019-05-12T19:15:59

Composite primary key

Primary Key		Attributes		
Actor (PARTITION)	**Movie (SORT)**			
Tom Hanks	Cast Away	Role	Year	Genre
		Chuck Noland	2000	Drama
Tom Hanks	Toy Story	Role	Year	Genre
		Woody	1995	Children's
Tim Allen	Toy Story	Role	Year	Genre
		Buzz Lightyear	1995	Children's
Natalie Portman	Black Swan	Role	Year	Genre
		Nina Sayers	2010	Drama

API actions

- **Item-based actions**

Item-based actions – *Writing, updating, deleting*

Primary Key		Attributes			
Actor (PARTITION)	**Movie (SORT)**				
Tom Hanks	Cast Away	**Role**	**Year**		**Genre**
		Chuck Noland		2000	Drama
Tom Hanks	Toy Story	**Role**	**Year**		**Genre**
		Woody		1995	Children's
Tim Allen	Toy Story	**Role**	**Year**		**Genre**
		Buzz Lightyear		1995	Children's
Natalie Portman	Black Swan	**Role**	**Year**		**Genre**
		Nina Sayers		2010	Drama

Item-based actions – *Writing, updating, deleting*

Must provide entire primary key

Primary Key		Attributes		
Actor (PARTITION)	Movie (SORT)			
Tom Hanks	Cast Away	**Role**	**Year**	**Genre**
		Chuck Noland	2000	Drama
Tom Hanks	Toy Story	**Role**	**Year**	**Genre**
		Woody	1995	Children's
Tim Allen	Toy Story	**Role**	**Year**	**Genre**
		Buzz Lightyear	1995	Children's
Natalie Portman	Black Swan	**Role**	**Year**	**Genre**
		Nina Sayers	2010	Drama

API actions

- Item-based actions

- **Query**

Query

Primary Key		Attributes			
Actor (PARTITION)	**Movie (SORT)**				
Tom Hanks	Cast Away	**Role**	**Year**		**Genre**
		Chuck Noland		2000	Drama
Tom Hanks	Toy Story	**Role**	**Year**		**Genre**
		Woody		1995	Children's
Tim Allen	Toy Story	**Role**	**Year**		**Genre**
		Buzz Lightyear		1995	Children's
Natalie Portman	Black Swan	**Role**	**Year**		**Genre**
		Nina Sayers		2010	Drama

Query

Must provide partition key

May provide sort key conditions

Primary Key		Attributes		
Actor (PARTITION)	**Movie (SORT)**			
Tom Hanks	Cast Away	**Role**	**Year**	**Genre**
		Chuck Noland	2000	Drama
Tom Hanks	Toy Story	**Role**	**Year**	**Genre**
		Woody	1995	Children's
Tim Allen	Toy Story	**Role**	**Year**	**Genre**
		Buzz Lightyear	1995	Children's
Natalie Portman	Black Swan	**Role**	**Year**	**Genre**
		Nina Sayers	2010	Drama

API actions

- Item-based actions

- Query

- **Scan**

Scan

Primary Key		Attributes		
Actor (PARTITION)	**Movie (SORT)**			
Tom Hanks	Cast Away	**Role**	**Year**	**Genre**
		Chuck Noland	2000	Drama
Tom Hanks	Toy Story	**Role**	**Year**	**Genre**
		Woody	1995	Children's
Tim Allen	Toy Story	**Role**	**Year**	**Genre**
		Buzz Lightyear	1995	Children's
Natalie Portman	Black Swan	**Role**	**Year**	**Genre**
		Nina Sayers	2010	Drama

Scan

Avoid!

Expensive
at scale

Primary Key		Attributes		
Actor (PARTITION)	**Movie (SORT)**			
		Role	**Year**	**Genre**
Tom Hanks	Cast Away	Chuck Noland	2000	Drama
		Role	**Year**	**Genre**
Tom Hanks	Toy Story	Woody	1995	Children's
		Role	**Year**	**Genre**
Tim Allen	Toy Story	Buzz Lightyear	1995	Children's
		Role	**Year**	**Genre**
Natalie Portman	Black Swan	Nina Sayers	2010	Drama

Secondary indexes

Secondary indexes

Primary Key		Attributes		
Actor (PARTITION)	**Movie (SORT)**			
Tom Hanks	Cast Away	**Role**	**Year**	**Genre**
		Chuck Noland	2000	Drama
Tom Hanks	Toy Story	**Role**	**Year**	**Genre**
		Woody	1995	Children's
Tim Allen	Toy Story	**Role**	**Year**	**Genre**
		Buzz Lightyear	1995	Children's
Natalie Portman	Black Swan	**Role**	**Year**	**Genre**
		Nina Sayers	2010	Drama

Secondary indexes

Primary Key		Attributes		
Actor (PARTITION)	**Movie (SORT)**			
Tom Hanks	Cast Away	**Role**	**Year**	**Genre**
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		Woody	1995	Children's
Tim Allen	Toy Story	**Role**	**Year**	**Genre**
		Buzz Lightyear	1995	Children's
Natalie Portman	Black Swan	**Role**	**Year**	**Genre**
		Nina Sayers	2010	Drama

Secondary indexes

GSI (MoviesActorsIndex)		Attributes		
Movie (PARTITION)	**Actor (SORT)**			
Cast Away	Tom Hanks	**Role**	**Year**	**Genre**
		Chuck Noland	2000	Drama
Toy Story	Tom Hanks	**Role**	**Year**	**Genre**
		Woody	1995	Children's
Toy Story	Tim Allen	**Role**	**Year**	**Genre**
		Buzz Lightyear	1995	Children's
Black Swan	Natalie Portman	**Role**	**Year**	**Genre**
		Nina Sayers	2010	Drama

Secondary indexes

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Movie (PARTITION)	**Actor (SORT)**			
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Black Swan	Natalie Portman	**Role**	**Year**	**Genre**
		Nina Sayers	2010	Drama

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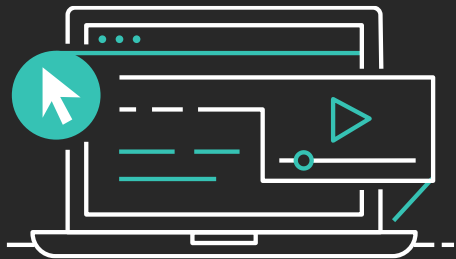
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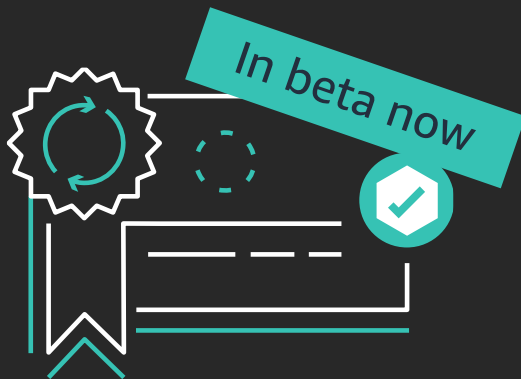
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Thank you!

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