aws re: Invent

DAT301-R5

Data modeling with Amazon DynamoDB in 60 minutes

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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?





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





Concepts

Table

Item

Primary key

Attributes

Primary Key	Attributes		
SessionId	Attributes		
01c1093b-7e54-4864-8d43-703e0fc1686b	Username	CreatedAt	ExpiresAt
01010930-7634-4664-6043-703601016660	blackwidow	2019-05-02T22:09:08	2019-05-03T22:09:09
E45-0-00 4500 4050 57-0 4445-5050005	Username	CreatedAt	ExpiresAt
54ba2c29-d533-43f0-b7a6-114bcf2f003f	thanos	2019-05-06T06:15:54	2019-05-07T06:15:54
f04f-040 F000 4b-4 004d -4-0Fb40-df0	Username	CreatedAt	ExpiresAt
f01fc912-5292-4ba1-821d-a1e05b42cdf9	ironman	2019-04-26T20:38:18	2019-04-27T20:38:18
ed7d2e9e-699e-4f21-a8b4-96c607740d98	Username	CreatedAt	ExpiresAt
eu/uzese-099e-4121-aob4-90000//40090	blackpanther	2019-05-11T19:15:59	2019-05-12T19:15:59

Table

Primary Key	Attributes		
SessionId	Attributes		
01c1093b-7e54-4864-8d43-703e0fc1686b	Username	CreatedAt	ExpiresAt
01010930-7634-4004-0043-703601010000	blackwidow	2019-05-02T22:09:08	2019-05-03T22:09:09
54ba2c29-d533-43f0-b7a6-114bcf2f003f	Username	CreatedAt	ExpiresAt
34ba2023-0333-4310-b1 a0-114b01210031	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
eu/uzese-055e-4121-a6b4-500007740u56	blackpanther	2019-05-11T19:15:59	2019-05-12T19:15:59

Item

Primary Key	Attributes		
SessionId	Attributes		
01c1093b-7e54-4864-8d43-703e0fc1686b	Username	CreatedAt	ExpiresAt
0101093b-7634-4664-6043-70360101666b	blackwidow	2019-05-02T22:09:08	2019-05-03T22:09:09
54ba2c29-d533-43f0-b7a6-114bcf2f003f	Username	CreatedAt	ExpiresAt
34ba2029-0333-4310-b1 a0-114b01210031	thanos	2019-05-06T06:15:54	2019-05-07T06:15:54
f01fc912-5292-4ba1-821d-a1e05b42cdf9	Username	CreatedAt	ExpiresAt
10 11C9 12-3292-40a 1-62 10-a 1603042C019	ironman	2019-04-26T20:38:18	2019-04-27T20:38:18
ed7d2e9e-699e-4f21-a8b4-96c607740d98	Username	CreatedAt	ExpiresAt
eu/uzese-055e-4121-a004-500007740050	blackpanther	2019-05-11T19:15:59	2019-05-12T19:15:59

Primary key

Primary Key
SessionId
01c1093b-7e54-4864-8d43-703e0fc1686b
54ba2c29-d533-43f0-b7a6-114bcf2f003f
f01fc912-5292-4ba1-821d-a1e05b42cdf9
ed7d2e9e-699e-4f21-a8b4-96c607740d98

1	Attributes					
I	Username	CreatedAt	ExpiresAt			
	blackwidow	2019-05-02T22:09:08	2019-05-03T22:09:09			
	Username	CreatedAt	ExpiresAt			
	thanos	2019-05-06T06:15:54	2019-05-07T06:15:54			
	Username	CreatedAt	ExpiresAt			
	ironman	2019-04-26T20:38:18	2019-04-27T20:38:18			
	Username	CreatedAt	ExpiresAt			
'	blackpanther	2019-05-11T19:15:59	2019-05-12T19:15:59			

Attributes

Primary Key	Attributes		
SessionId			
01c1093b-7e54-4864-8d43-703e0fc1686b	Username	CreatedAt	ExpiresAt
01010930-7634-4664-6043-703601016660	blackwidow	2019-05-02T22:09:08	2019-05-03T22:09:09
E45-0-00 dE00 d000 b7-0 4445-6000006	Username	CreatedAt	ExpiresAt
54ba2c29-d533-43f0-b7a6-114bcf2f003f	thanos	2019-05-06T06:15:54	2019-05-07T06:15:54
f01fc912-5292-4ba1-821d-a1e05b42cdf9	Username	CreatedAt	ExpiresAt
10 110912-5292-40a1-6210-a1e050420019	ironman	2019-04-26T20:38:18	2019-04-27T20:38:18
ed7d2e9e-699e-4f21-a8b4-96c607740d98	Username	CreatedAt	ExpiresAt
eu/uzese-099e-4121-aob4-900007740096	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
SessionId
01c1093b-7e54-4864-8d43-703e0fc1686b
54ba2c29-d533-43f0-b7a6-114bcf2f003f
f01fc912-5292-4ba1-821d-a1e05b42cdf9
ed7d2e9e-699e-4f21-a8b4-96c607740d98

Attributes					
Username	CreatedAt	ExpiresAt			
blackwidow	2019-05-02T22:09:08	2019-05-03T22:09:09			
Username	CreatedAt	ExpiresAt			
thanos	2019-05-06T06:15:54	2019-05-07T06:15:54			
Username	CreatedAt	ExpiresAt			
ironman	2019-04-26T20:38:18	2019-04-27T20:38:18			
Username	CreatedAt	ExpiresAt			
blackpanther	2019-05-11T19:15:59	2019-05-12T19:15:59			

Composite primary key

Primary Key				
Actor (PARTITION)	Movie (SORT)			
Tom Hanks	Cast Away			
Tom Hanks	Toy Story			
Tim Allen	Toy Story			
Natalie Portman	Black Swan			

Attrib	outes	
Year		Genre
	2000	Drama
Year		Genre
	1995	Children's
Year		Genre
	1995	Children's
Year		Genre
	2010	Drama
	Year Year Year	2000 Year 1995 Year 1995 Year

API actions

Item-based actions

Item-based actions – Writing, updating, deleting

Prima	ary Key	Attributes			
Actor (PARTITION)	Movie (SORT)	Attributes			
Tom Hanks	Cast Away	Role	Year		Genre
TOTT HATIKS	Cast Away	Chuck Noland		2000	Drama
Tom Hanks T	Toy Story	Role	Year		Genre
TOTTI FIATIKS		Woody		1995	Children's
Tim Allen	Toy Stony	Role	Year		Genre
Tim Allen	Toy Story	Buzz Lightyear		1995	Children's
Notalia Dantusan	Black Swan	Role	Year		Genre
Natalie Portman		Nina Sayers		2010	Drama

Item-based actions – Writing, updating, deleting

Must provide entire primary key

Prima	ary Key	Attvibutoo		
Actor (PARTITION)	Movie (SORT)	Attributes		
Tom Hanks	Cast Away	Role	Year	Genre
TOTT HATIKS CASEA	Cast Away	Chuck Noland	2000	Drama
Tom Hanks	Toy Story	Role	Year	Genre
TOTT FIATIKS		Woody	1995	Children's
Tim Allen	Toy Stony	Role	Year	Genre
Tim Allen	Tim Allen Toy Story		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)	Attributes		
Tom Hanks	Cast Away	Role	Year	Genre
Tom Hanks	Cast Away	Chuck Noland	20	00 Drama
Torre Hambre	Toy Story	Role	Year	Genre
Tom Hanks		Woody	19	95 Children's
Tim Allen	Toy Story	Role	Year	Genre
		Buzz Lightyear	19	95 Children's
Natalie Portman	Black Swan	Role	Year	Genre
		Nina Sayers	20	10 Drama

Query

Must provide partition key

May provide sort key conditions

Primary Key		Attributes		
Actor (PARTITION)	Movie (SORT)	Attributes		
Tom Hanks	Coot Away	Role	Year	Genre
TOTT HATIKS	Cast Away	Chuck Noland	2000	Drama
Tom Hanks	Toy Story	Role	Year	Genre
TOTT HATIKS		Woody	1995	Children's
Tim Allen	Toy Story	Role	Year	Genre
Tim Allen		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)	Attributes		
Tom Hanks	Cast Away	Role	Year	Genre
	Cast Away	Chuck Noland	2000	Drama
Toro Hanks	Toy Story	Role	Year	Genre
Tom Hanks		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)	Attributes		
Tom Hanks	Cast Away	Role	Year	Genre
TOTT Hanks		Chuck Noland	2000	Drama
Tom Hanks	Toy Story	Role	Year	Genre
TOTT HATIKS		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

Primary Key		Attributes			
Actor (PARTITION)	Movie (SORT)	Attributes			
Tom Hanks	Cast Away	Role	Year		Genre
TOTT TIATINS		Chuck Noland		2000	Drama
Tom Hanks	Toy Story	Role	Year		Genre
TOTTI FIATIKS		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

Primary Key		Attributes			
Actor (PARTITION)	Movie (SORT)	Attributes			
Tom Hanks	Cast Away	Role	Year		Genre
TOTTITIATINS	Cast Away	Chuck Noland		2000	Drama
Tom Hanks	Toy Story	Role	Year		Genre
TOTTI FIATIKS		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

GSI (MoviesActorsIndex)		Attributes		
Movie (PARTITION)	Actor (SORT)	Attributes		
Cast Away	Tom Hanks	Role	Year	Genre
Cast Away	TOTTI MATIKS	Chuck Noland	2000	Drama
Tour Cham.	Tom Hanks	Role	Year	Genre
Toy Story		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

GSI (MoviesActorsIndex)		Attributes		
Movie (PARTITION)	Actor (SORT)	Attributes		
Cast Away	Tom Hanks	Role	Year	Genre
Cast Away	TOTTI MATIKS	Chuck Noland	2000	Drama
Toy Story	Tom Hanks	Role	Year	Genre
Toy Story		Woody	1999	Children's
Toy Story	Tim Allen	Role	Year	Genre
Toy Story		Buzz Lightyear	1999	Children's
Black Swan	Natalie Portman	Role	Year	Genre
		Nina Sayers	2010	Drama

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Thank you!

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