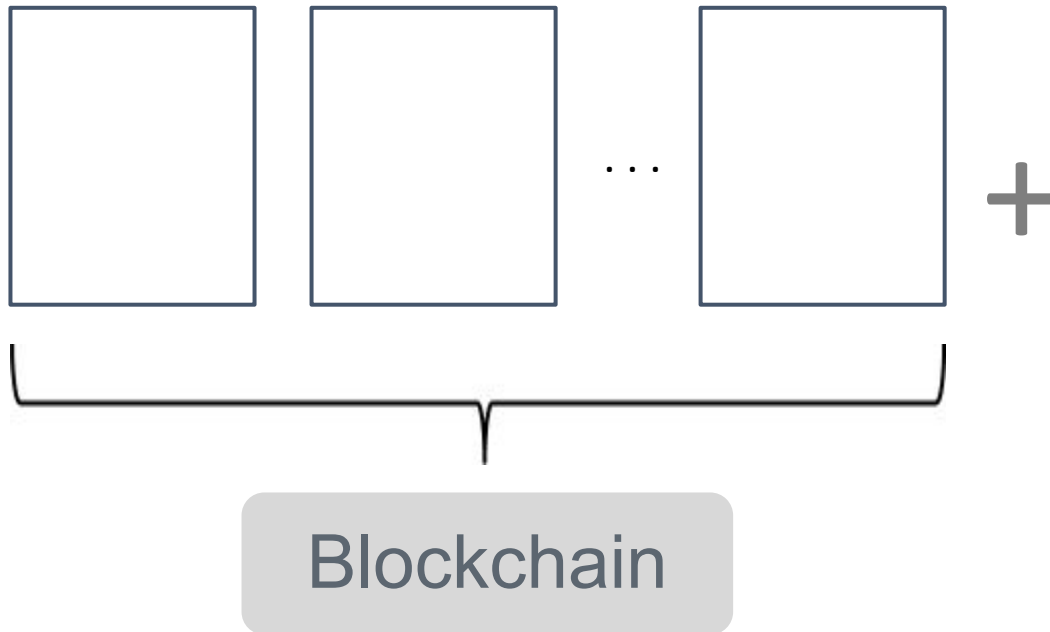


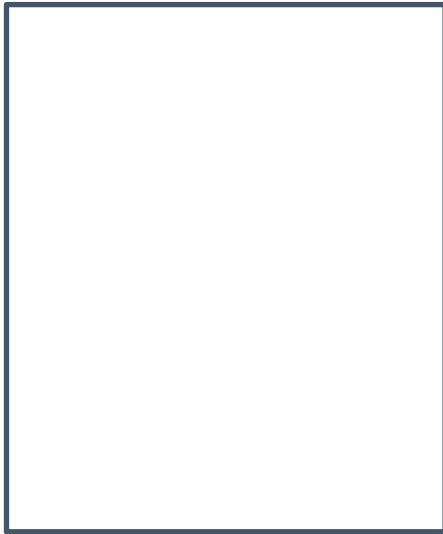
From Blocks to a Blockchain



Alice:	5 BTC
Bob:	2 BTC
John:	21 BTC
Joe:	1 BTC
Amy:	0.6 BTC
Leslie:	43 BTC
.	
.	
.	
Tim:	8 BTC
Nicole:	0.3 BTC
Jesse:	11 BTC
Steven:	17 BTC
Darren:	3 BTC
Jose:	0.1 BTC

Blockchain - Detail

Block 100

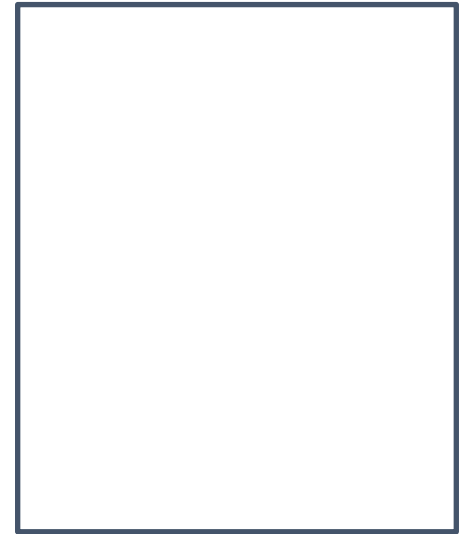


Block 101

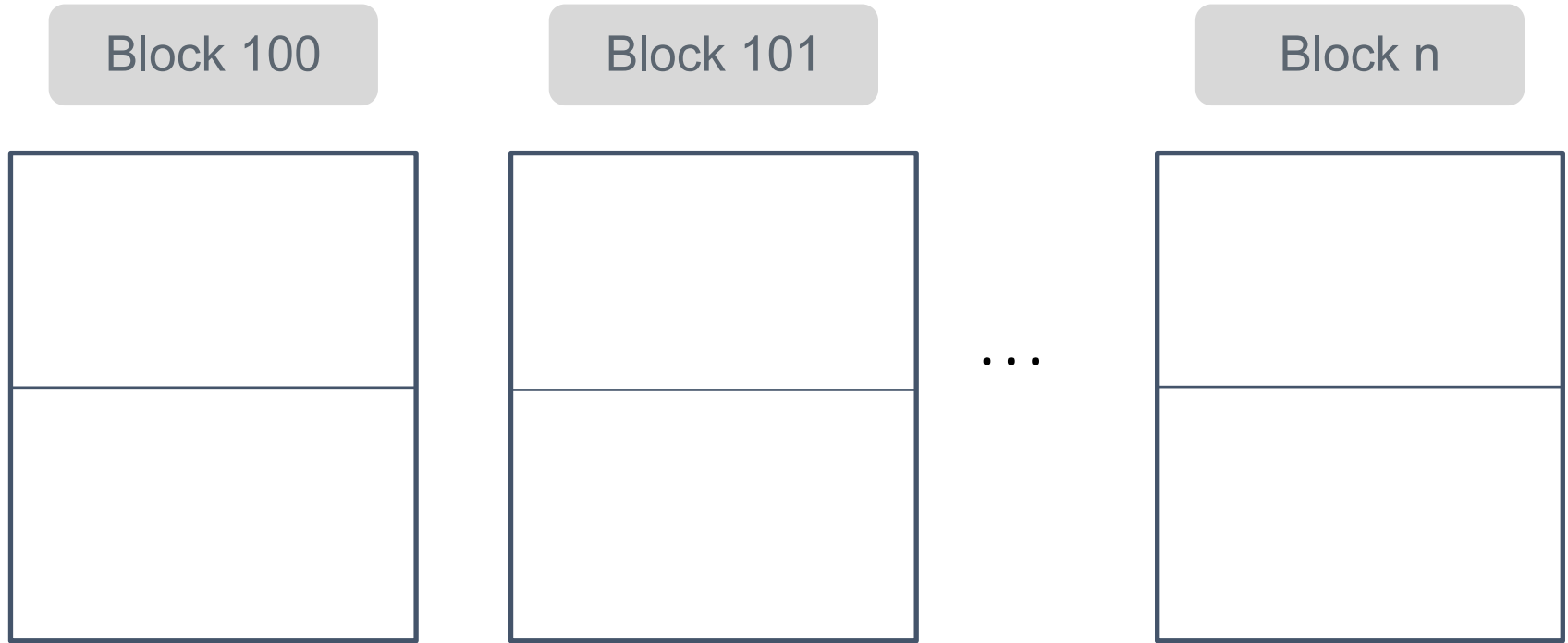


...

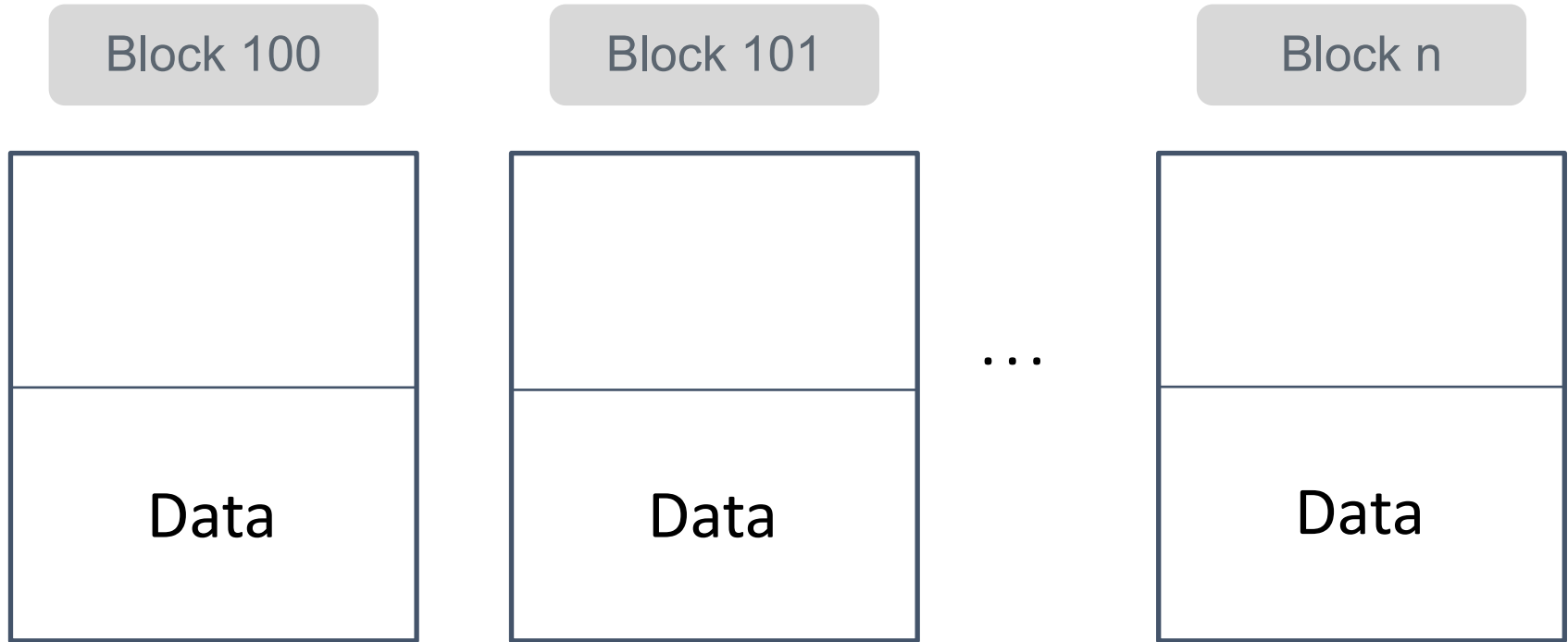
Block n



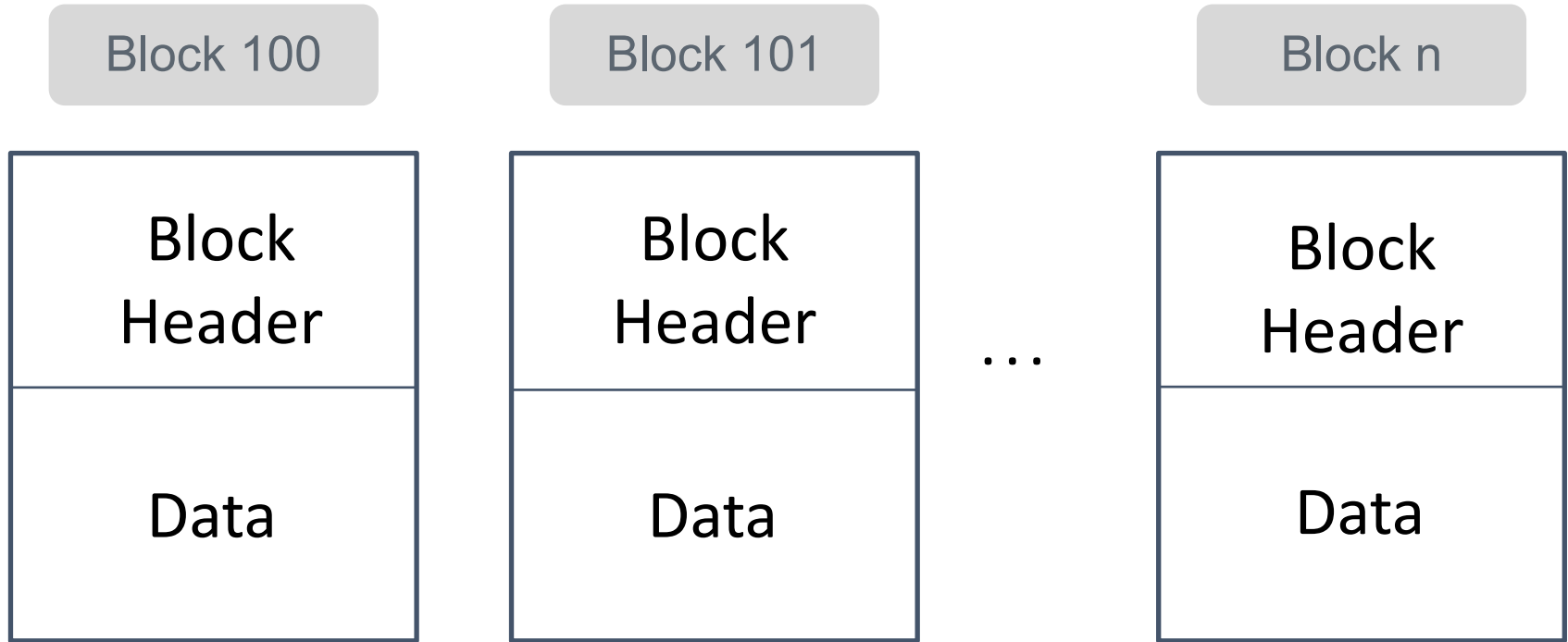
Blockchain – Two Main Components



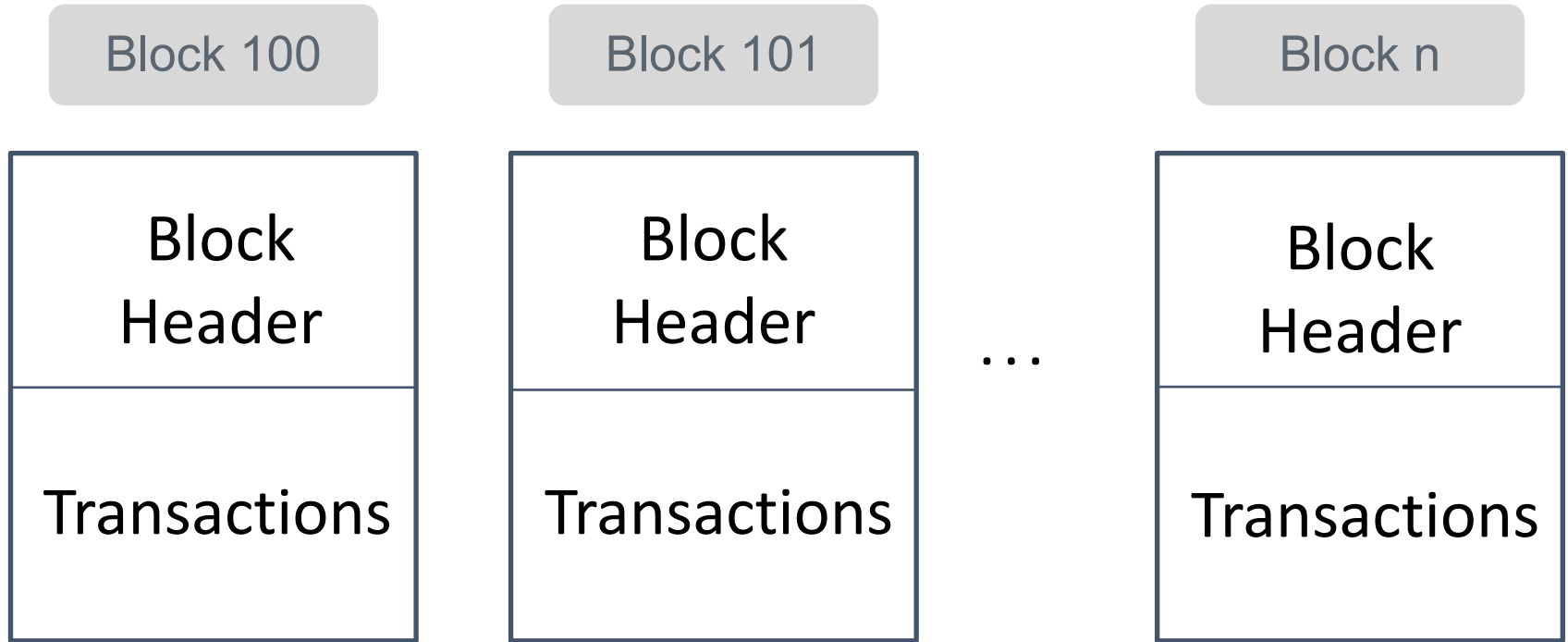
Blockchain Component – 1) Data to Store



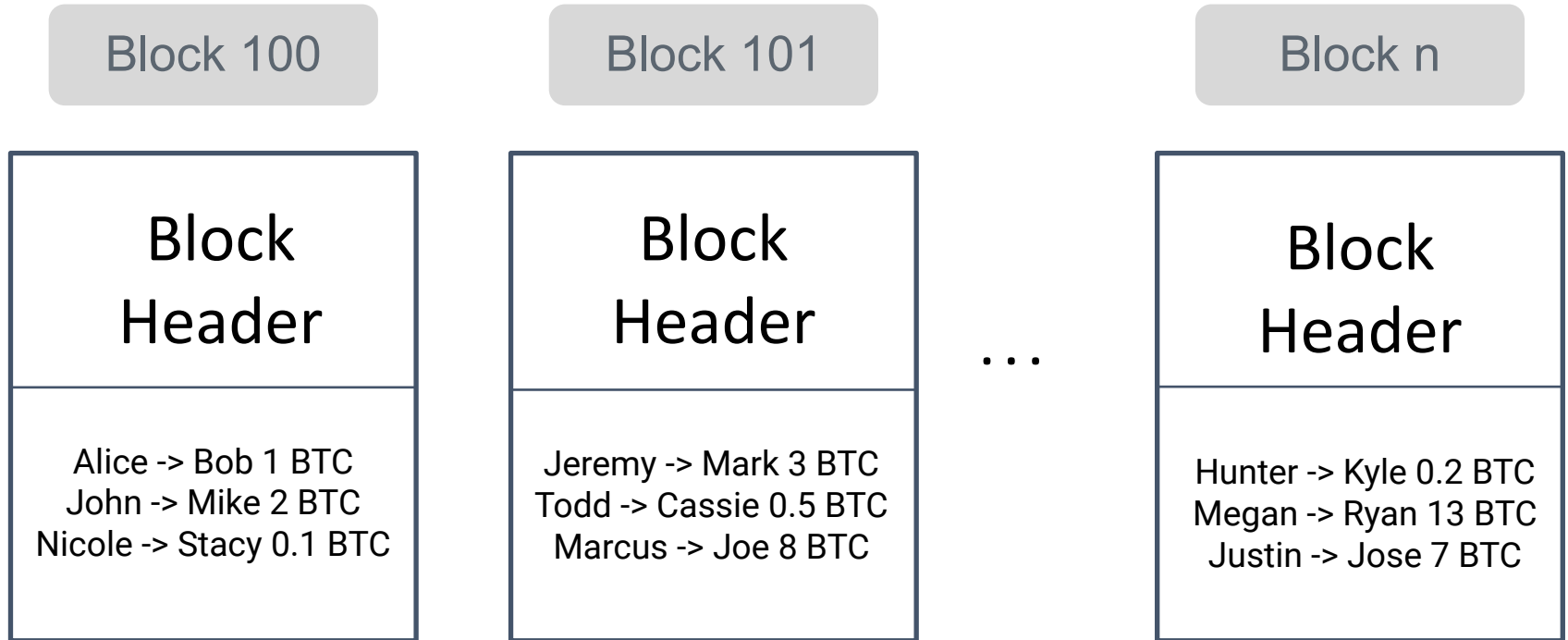
Blockchain Component – 2) Block Header



From Data to Transactions



Transaction Model with Two Accounts



What Goes in the Block Header?

Block 100

Timestamp
Hash of Previous Block Header
Hash of Transactions
Nonce
Alice -> Bob 1 BTC John -> Mike 2 BTC Nicole -> Stacy 0.1 BTC

Block 101

Timestamp
Hash of Previous Block Header
Hash of Transactions
Nonce
Jeremy -> Mark 3 BTC Todd -> Cassie 0.5 BTC Marcus -> Joe 8 BTC

...

Block n

Block Header
Hunter -> Kyle 0.2 BTC Megan -> Ryan 13 BTC Justin -> Jose 7 BTC

Block Header Detail (1/5)

Block 100

10:49 PM
Hash of Previous Block Header
Hash of Transactions
Nonce
Alice -> Bob 1 BTC John -> Mike 2 BTC Nicole -> Stacy 0.1 BTC

Block 101

11:01 PM
Hash of Previous Block Header
Hash of Transactions
Nonce
Jeremy -> Mark 3 BTC Todd -> Cassie 0.5 BTC Marcus -> Joe 8 BTC

...

Block n

Block Header
Hunter -> Kyle 0.2 BTC Megan -> Ryan 13 BTC Justin -> Jose 7 BTC

Block Header Detail (2/5)

Block 100

10:49 PM
Hash of Previous Block Header
Hash of Transactions
Nonce
Alice -> Bob 1 BTC John -> Mike 2 BTC Nicole -> Stacy 0.1 BTC

Block 101

11:01 PM
Hash of Previous Block Header
Hash of Transactions
Nonce
Jeremy -> Mark 3 BTC Todd -> Cassie 0.5 BTC Marcus -> Joe 8 BTC

...

Block n

Block Header
Hunter -> Kyle 0.2 BTC Megan -> Ryan 13 BTC Justin -> Jose 7 BTC

Block Header Detail (3/5)

Block 100

10:49 PM
Hash of Previous Block Header
Hash of Transactions
Nonce
Alice -> Bob 1 BTC John -> Mike 2 BTC Nicole -> Stacy 0.1 BTC



Hash Function



8f434...9b2dc327aa4

Block 101

11:01 PM
Hash of Previous Block Header
Hash of Transactions
Nonce
Jeremy -> Mark 3 BTC Todd -> Cassie 0.5 BTC Marcus -> Joe 8 BTC

...

Block n

Block Header
Hunter -> Kyle 0.2 BTC Megan -> Ryan 13 BTC Justin -> Jose 7 BTC

Block Header Detail (4/5)

Block 100

10:49 PM
Hash of Previous Block Header
8f434...9b2dc327aa4
Nonce
Alice -> Bob 1 BTC John -> Mike 2 BTC Nicole -> Stacy 0.1 BTC



Hash Function



8f434...9b2dc327aa4

Block 101

11:01 PM
Hash of Previous Block Header
Hash of Transactions
Nonce
Jeremy -> Mark 3 BTC Todd -> Cassie 0.5 BTC Marcus -> Joe 8 BTC

...

Block n

Block Header
Hunter -> Kyle 0.2 BTC Megan -> Ryan 13 BTC Justin -> Jose 7 BTC

Block Header Detail (5/5)

Block 100

10:49 PM
Hash of Previous Block Header
8f434...9b2dc327aa4
Nonce
Alice -> Bob 1 BTC John -> Mike 2 BTC Nicole -> Stacy 0.1 BTC

Block 101

11:01 PM
Hash of Previous Block Header
0466d...ae8376bbc67
Nonce
Jeremy -> Mark 3 BTC Todd -> Cassie 0.5 BTC Marcus -> Joe 8 BTC

...

Block n

Block Header
Hunter -> Kyle 0.2 BTC Megan -> Ryan 13 BTC Justin -> Jose 7 BTC

Hash of the Previous Block Header

Block 100

10:49 PM
19d7c...0723301e493
8f434...9b2dc327aa4
Nonce
Alice -> Bob 1 BTC John -> Mike 2 BTC Nicole -> Stacy 0.1 BTC

Block 101

11:01 PM
Hash of Previous Block Header
0466d...ae8376bbc67
Nonce
Jeremy -> Mark 3 BTC Todd -> Cassie 0.5 BTC Marcus -> Joe 8 BTC

...

Block n

Block Header
Hunter -> Kyle 0.2 BTC Megan -> Ryan 13 BTC Justin -> Jose 7 BTC

Block 101 Process: See Block 100 (1/4)

Block 100

10:49 PM
19d7c...0723301e493
8f434...9b2dc327aa4
Nonce
Alice -> Bob 1 BTC John -> Mike 2 BTC Nicole -> Stacy 0.1 BTC

Block 101

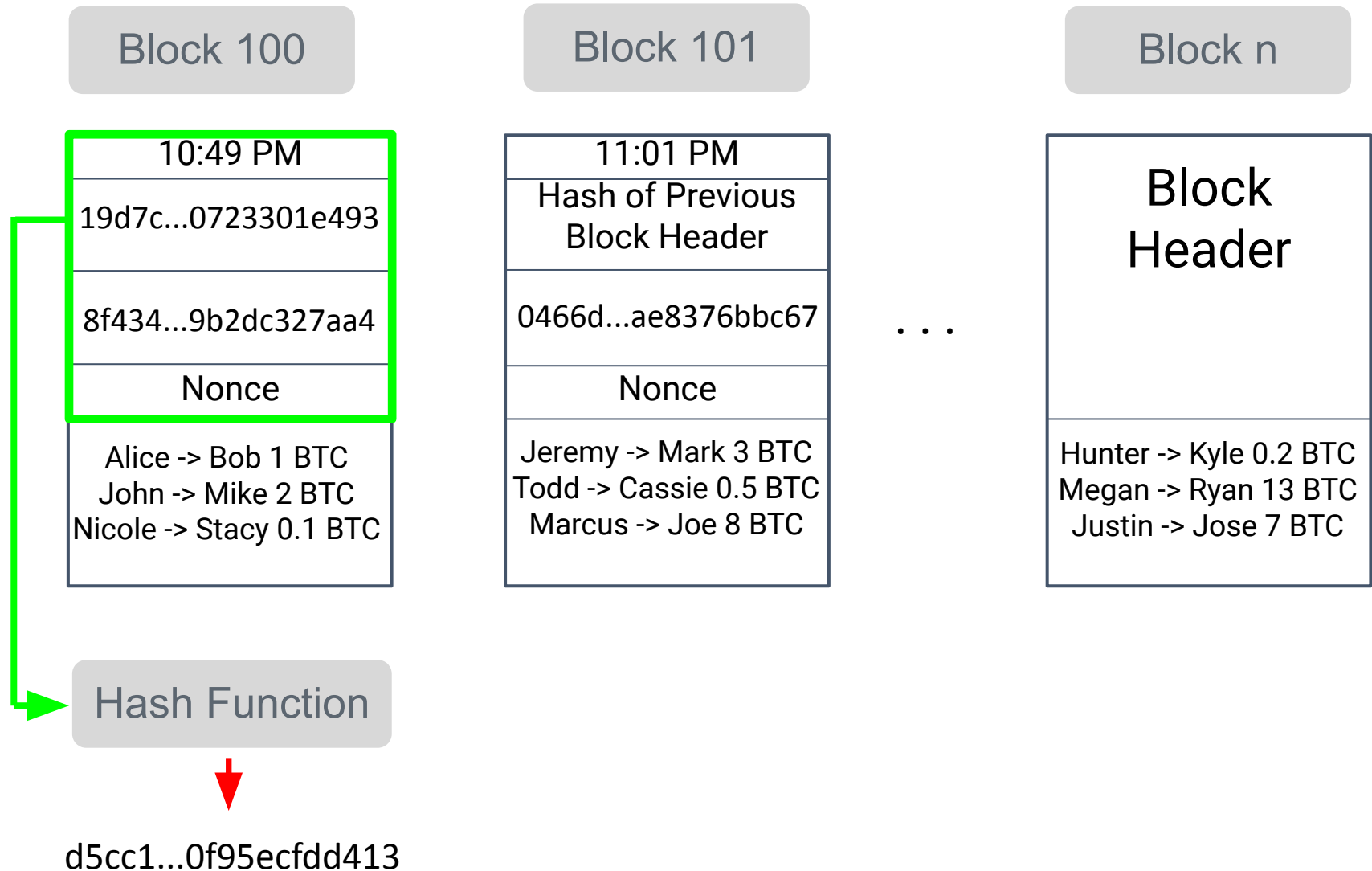
11:01 PM
Hash of Previous Block Header
0466d...ae8376bbc67
Nonce
Jeremy -> Mark 3 BTC Todd -> Cassie 0.5 BTC Marcus -> Joe 8 BTC

...

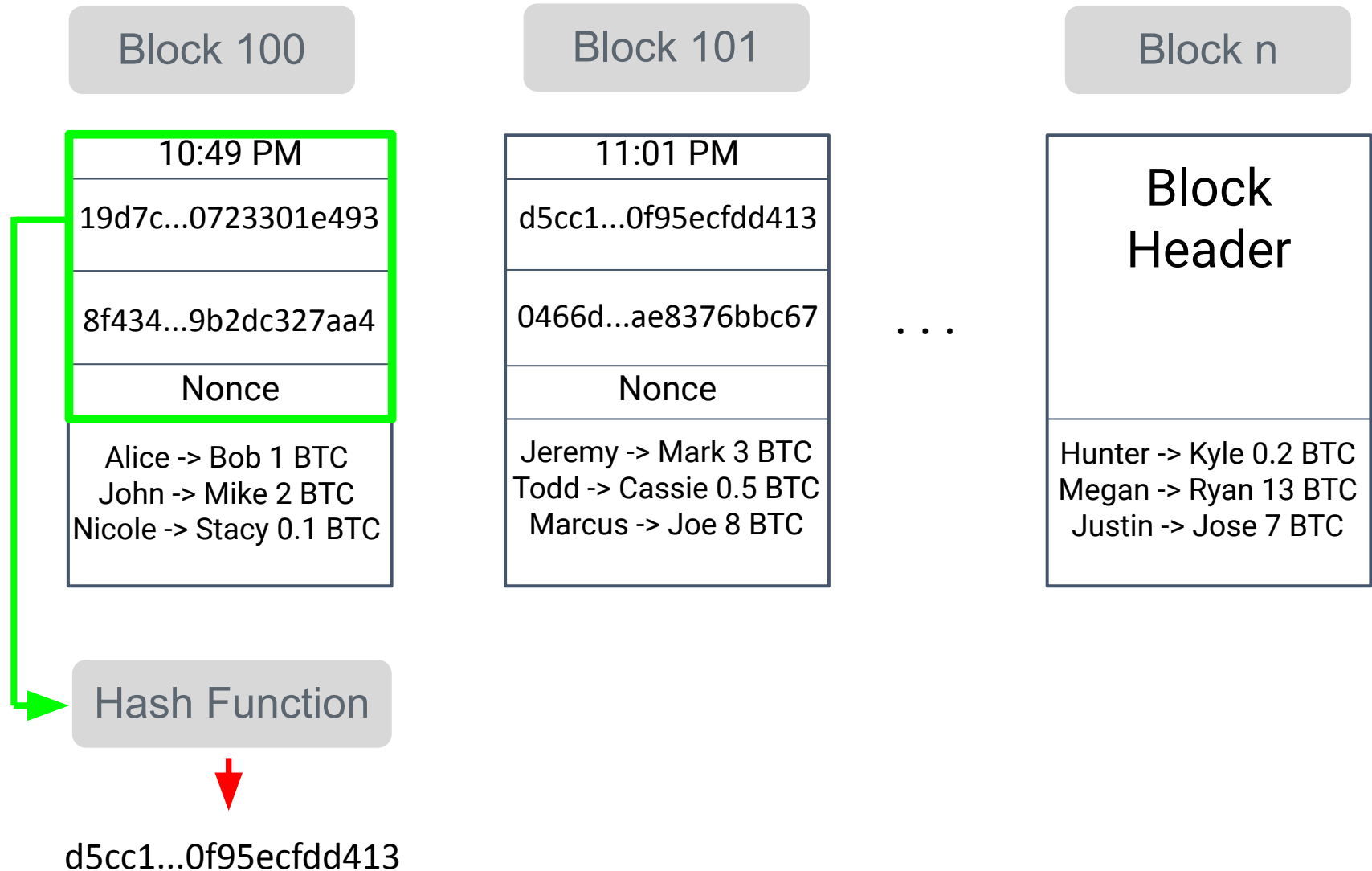
Block n

Block Header
Hunter -> Kyle 0.2 BTC Megan -> Ryan 13 BTC Justin -> Jose 7 BTC

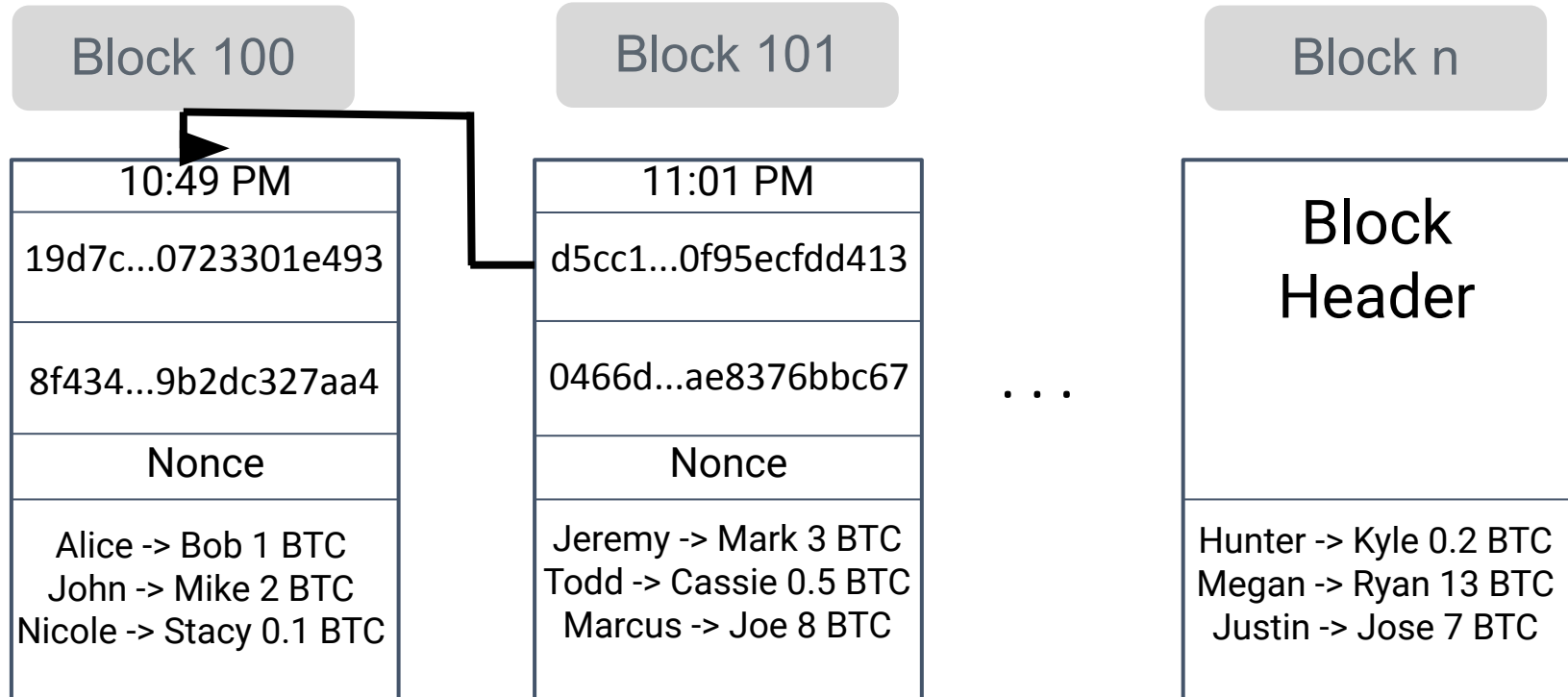
Block 101 Process: See Block 100 (2/4)



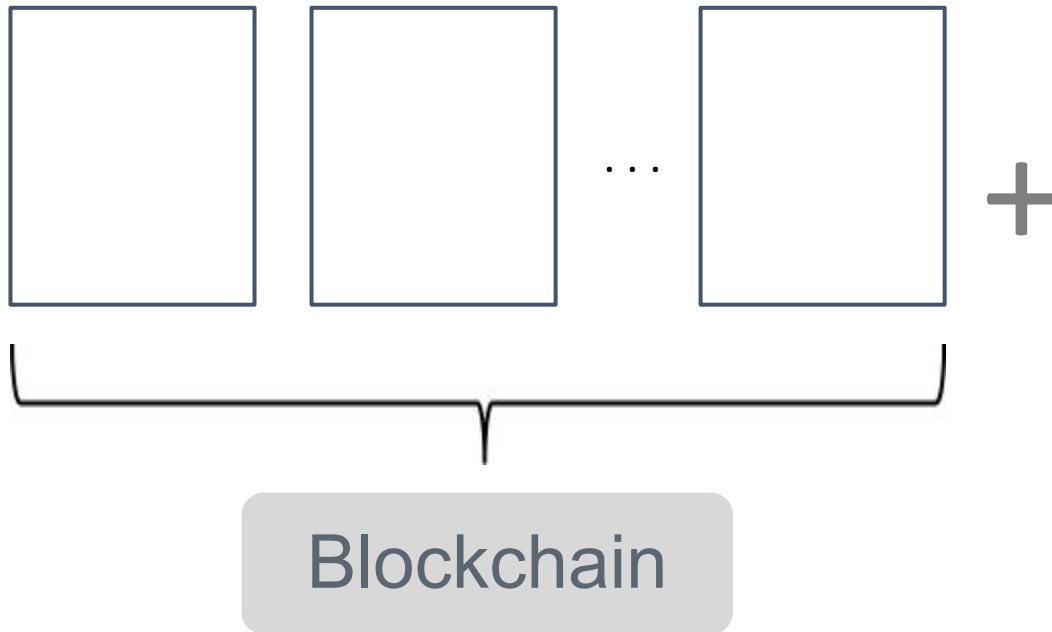
Block 101 Process: See Block 100 (3/4)



Block 101 Process: See Block 100 (4/4)



Back to the Big Picture (1/2)



Alice:	5 BTC
Bob:	2 BTC
John:	21 BTC
Joe:	1 BTC
Amy:	0.6 BTC
Leslie:	43 BTC
.	.
.	.
.	.
Tim:	8 BTC
Nicole:	0.3 BTC
Jesse:	11 BTC
Steven:	17 BTC
Darren:	3 BTC
Jose:	0.1 BTC

Back to the Big Picture (2/2)

