AWS DynamoDB Deep Dive

INTRODUCTION TO DYNAMODB

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What is DynamoDB

NoSQL database

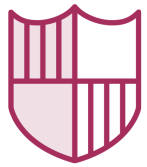
One of the core AWS services

Provides unique features

Why DynamoDB is Awesome

Massively scalable with low latency

Low operational load



High-availability

Integrated with many AWS services

DynamoDB Users

Under Armour

Airbnb

Lyft

Duolingo

Adobe

Prerequisites

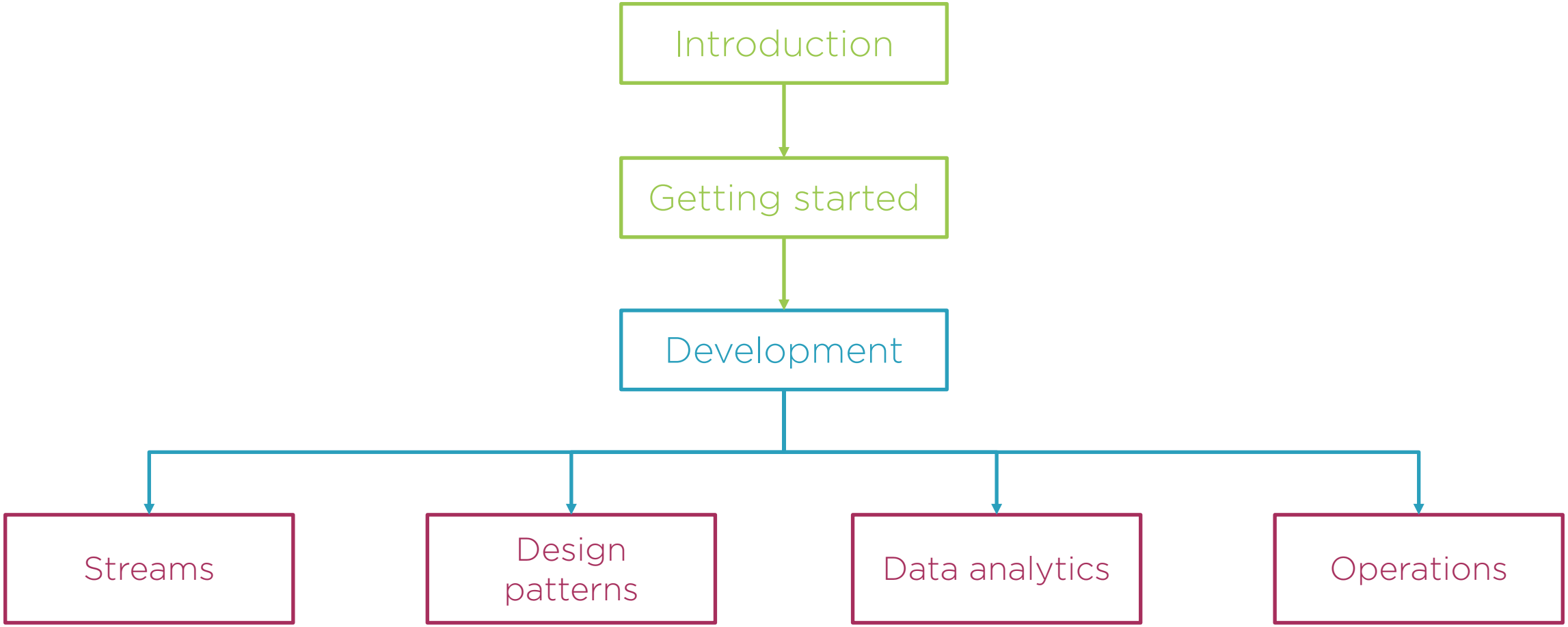
NO need for DynamoDB knowledge

Knowledge of Java

General software development experience

Basic knowledge of AWS

Course Structure



What We Will Implement

Globomantics is starting a new online shop

Expecting to work on massive scale

Need robust and scalable data storage

NoSQL Databases

Introduce NoSQL

CAP theorem

Why we can't have the best of SQL and NoSQL

SQL/NoSQL Comparison

SQL databases	NoSQL databases
Has been around for long time	Emerged as response to new workloads
One master node (vertical scaling)	Many nodes (horizontal scaling)
SQL language	Different query languages
Similar to each other	Wide spectrum of solutions
ACID (Atomicity, Consistency, Isolation, Durability)	BASE (Basic Availability, Soft-state, Eventual consistency)

Can I have it all?!

Three System Guarantees (pick two)

Consistency

Receive the latest data on every read

Availability

Every requests receives a non-error reply

Partition tolerance

System works despite some packets dropped

Three System Guarantees (pick one)

Consistency

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Partition tolerance

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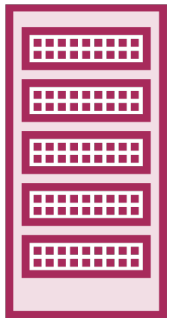
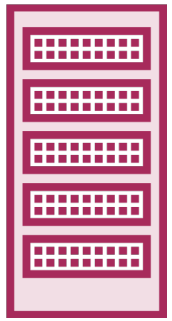
Distributed System



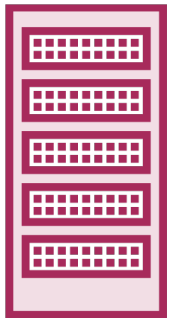
Val	0

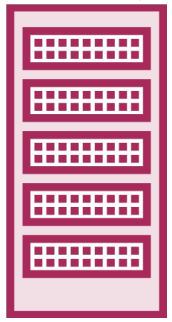


Val	0

Distributed System

Val=5



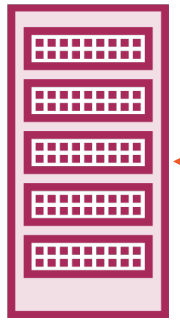


Val	0

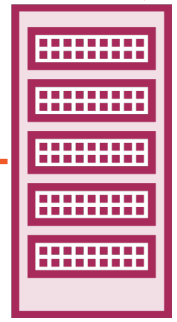
Val	5

Distributed System

Val=5



Val=5



Val	5

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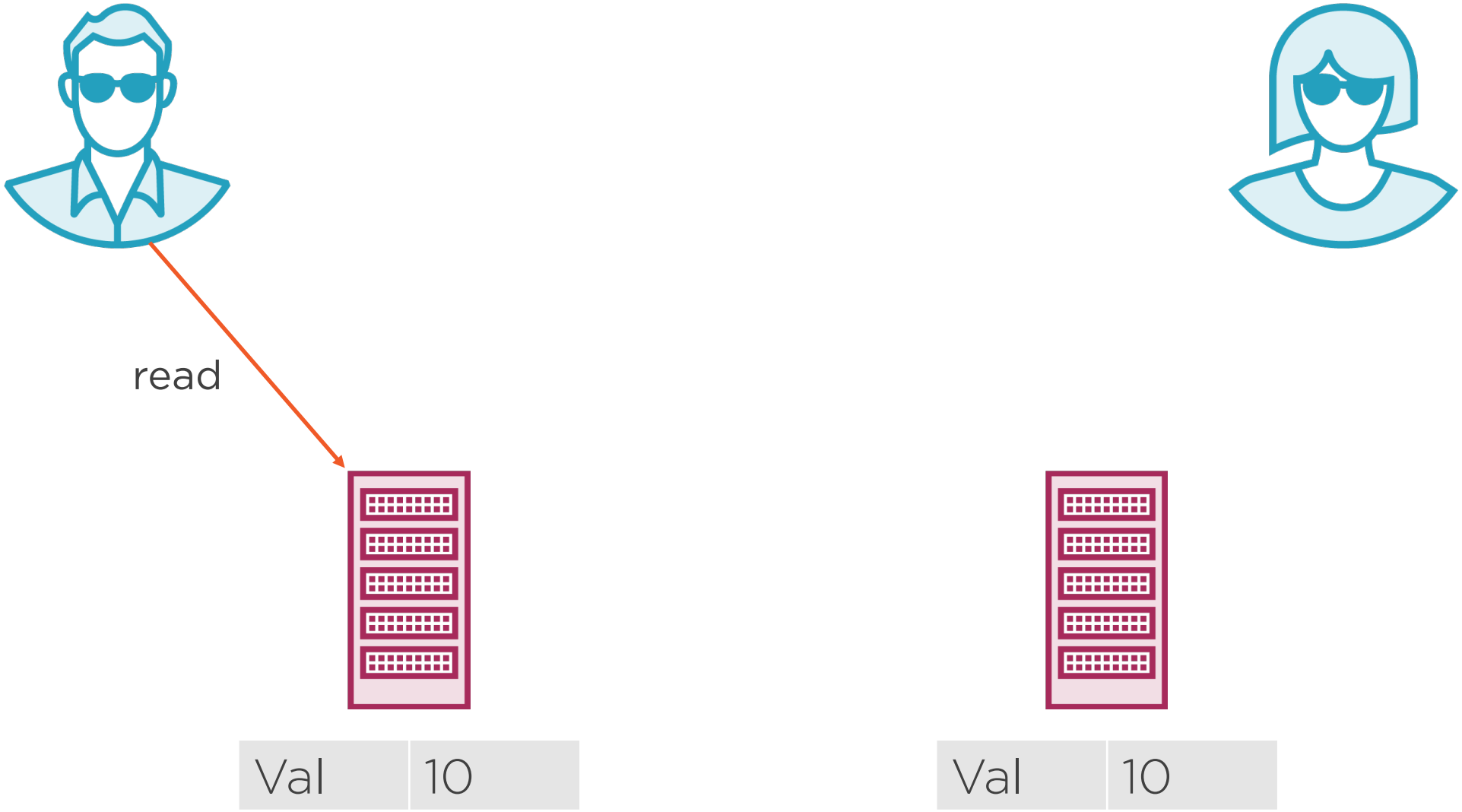
Read in Distributed System



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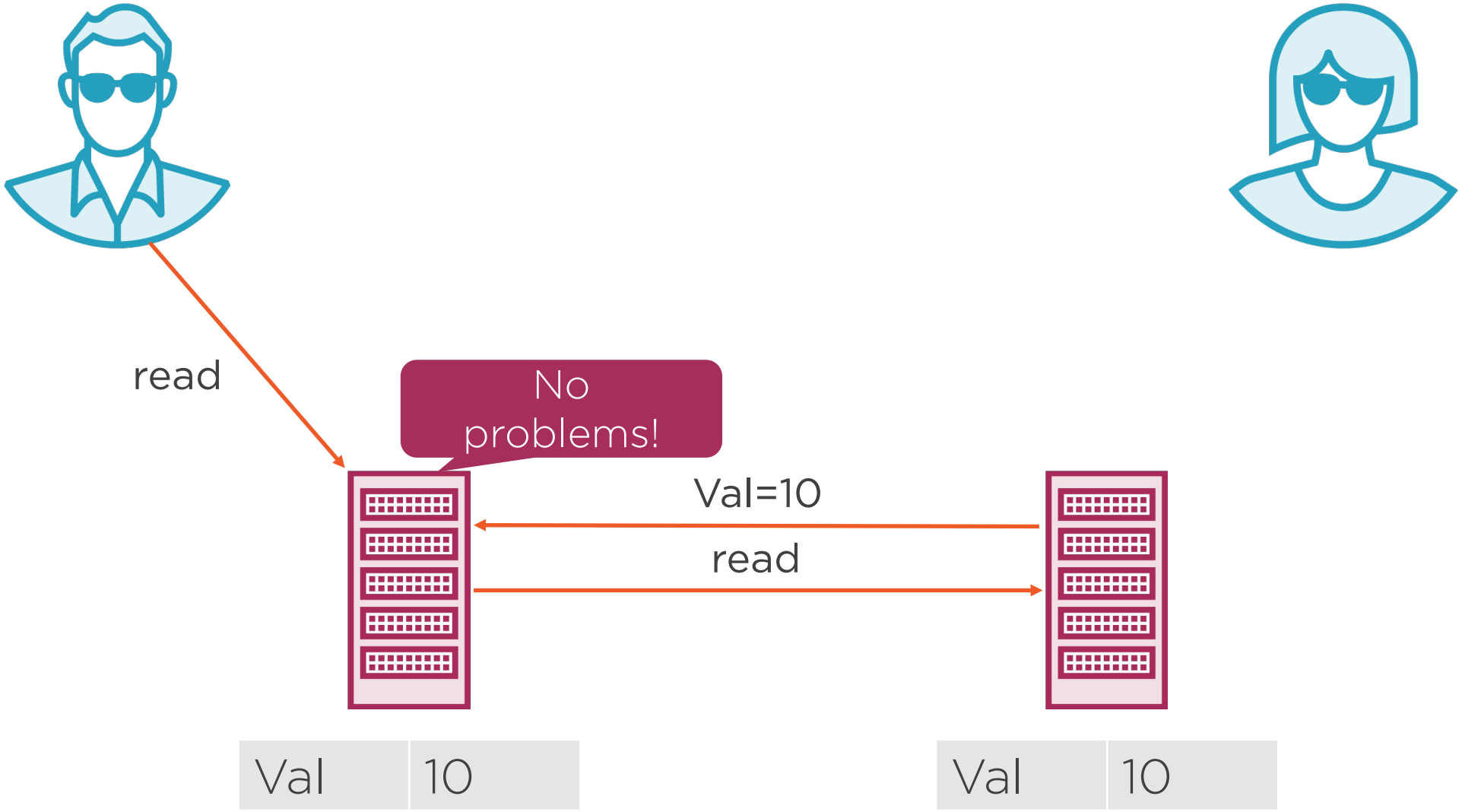

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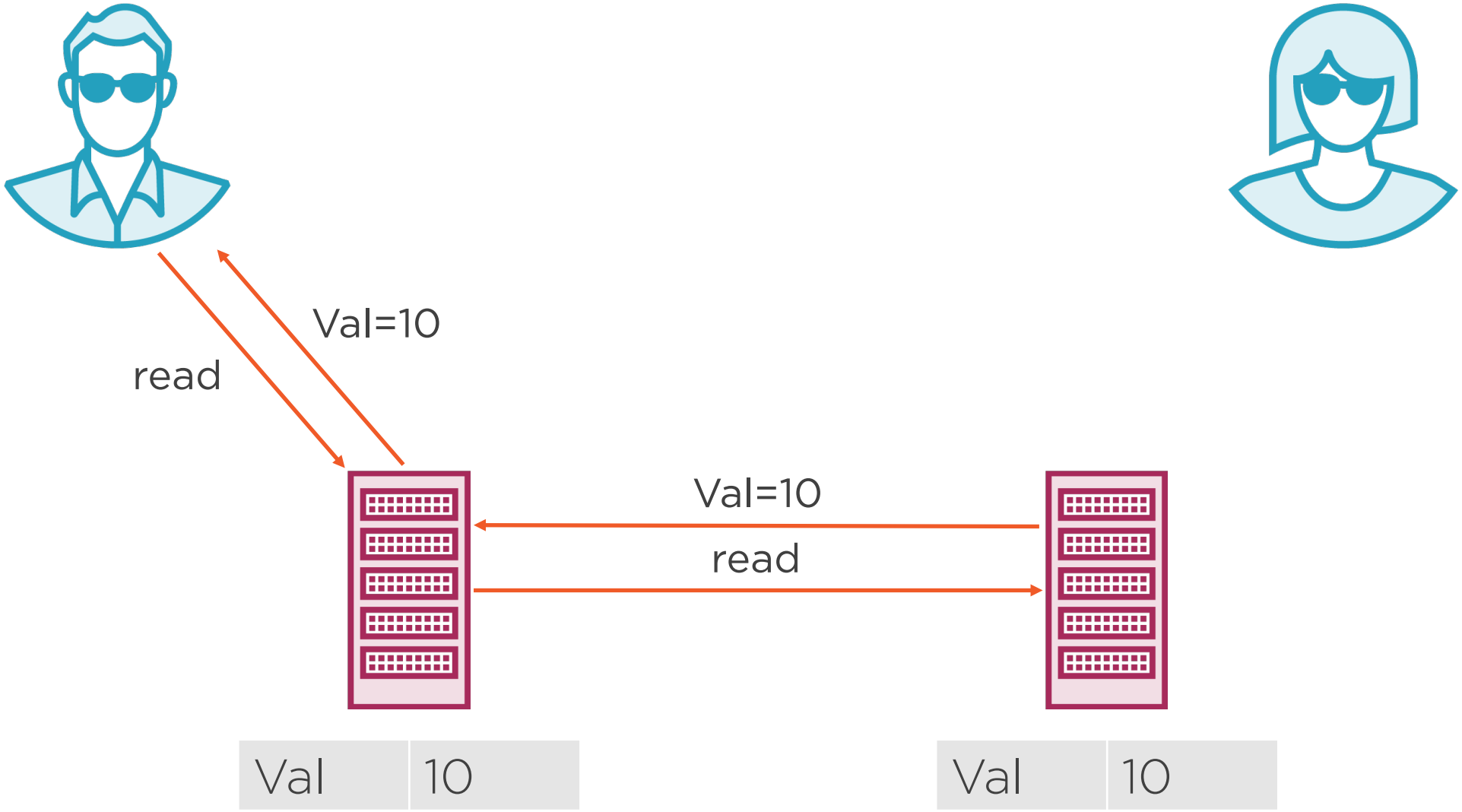
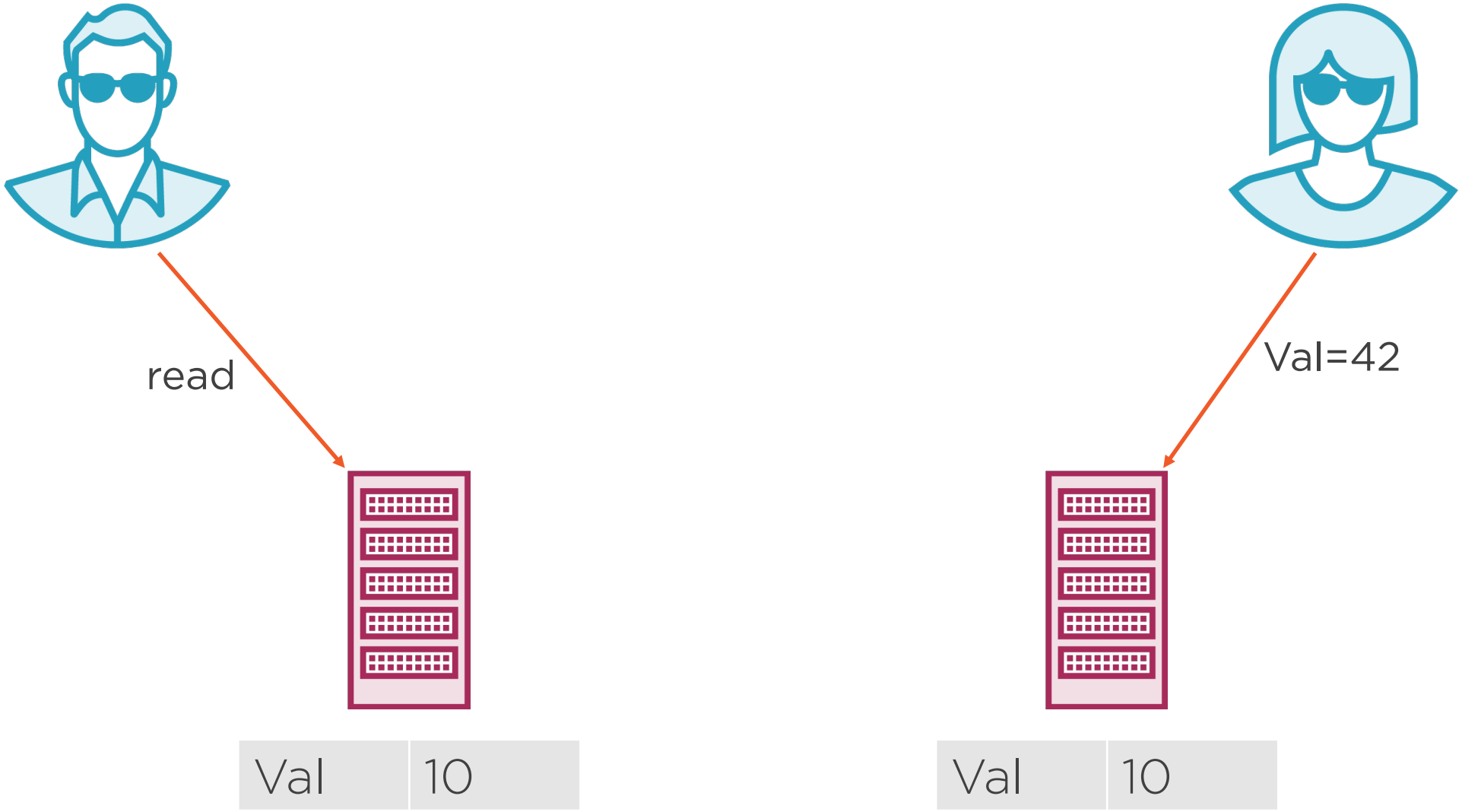
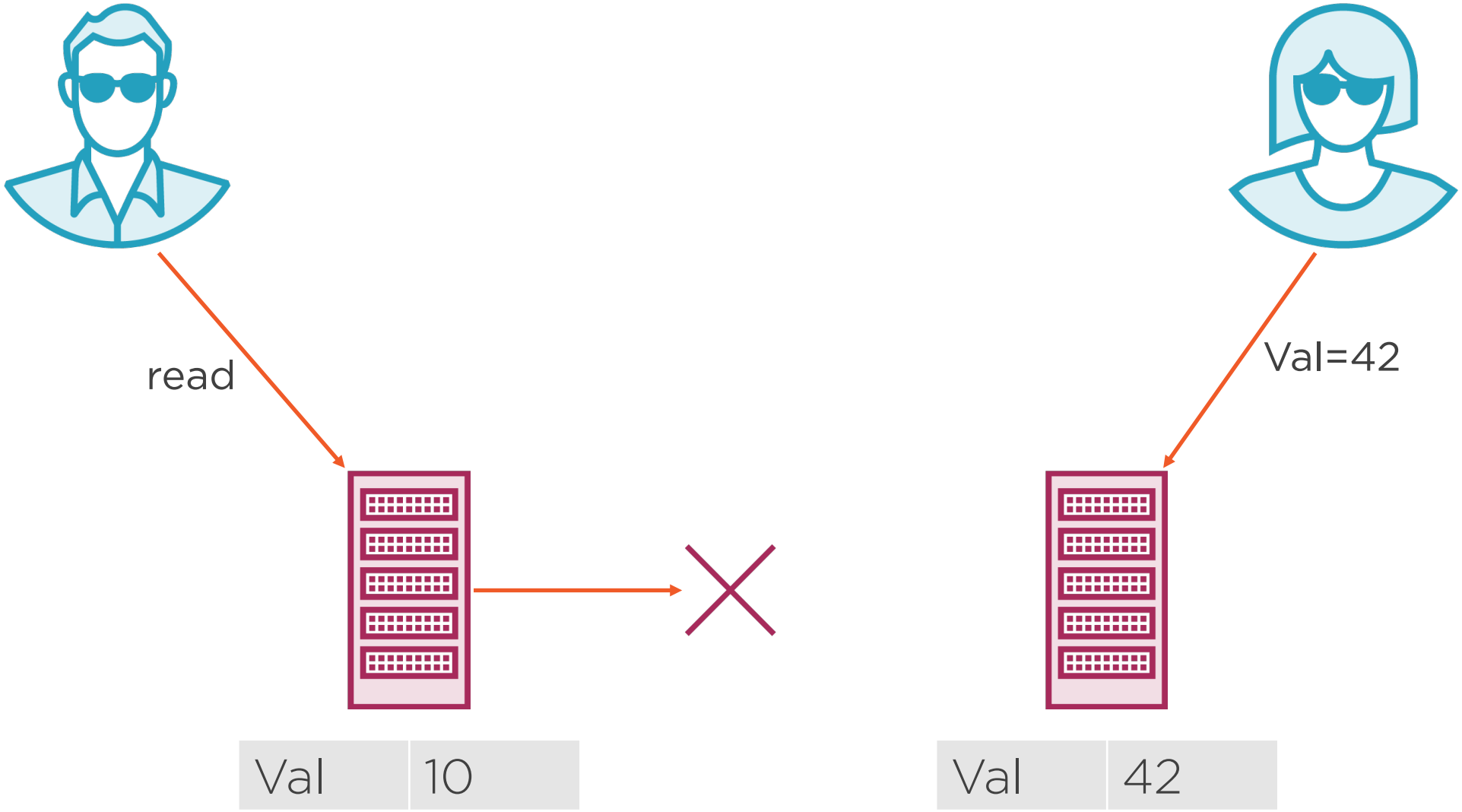


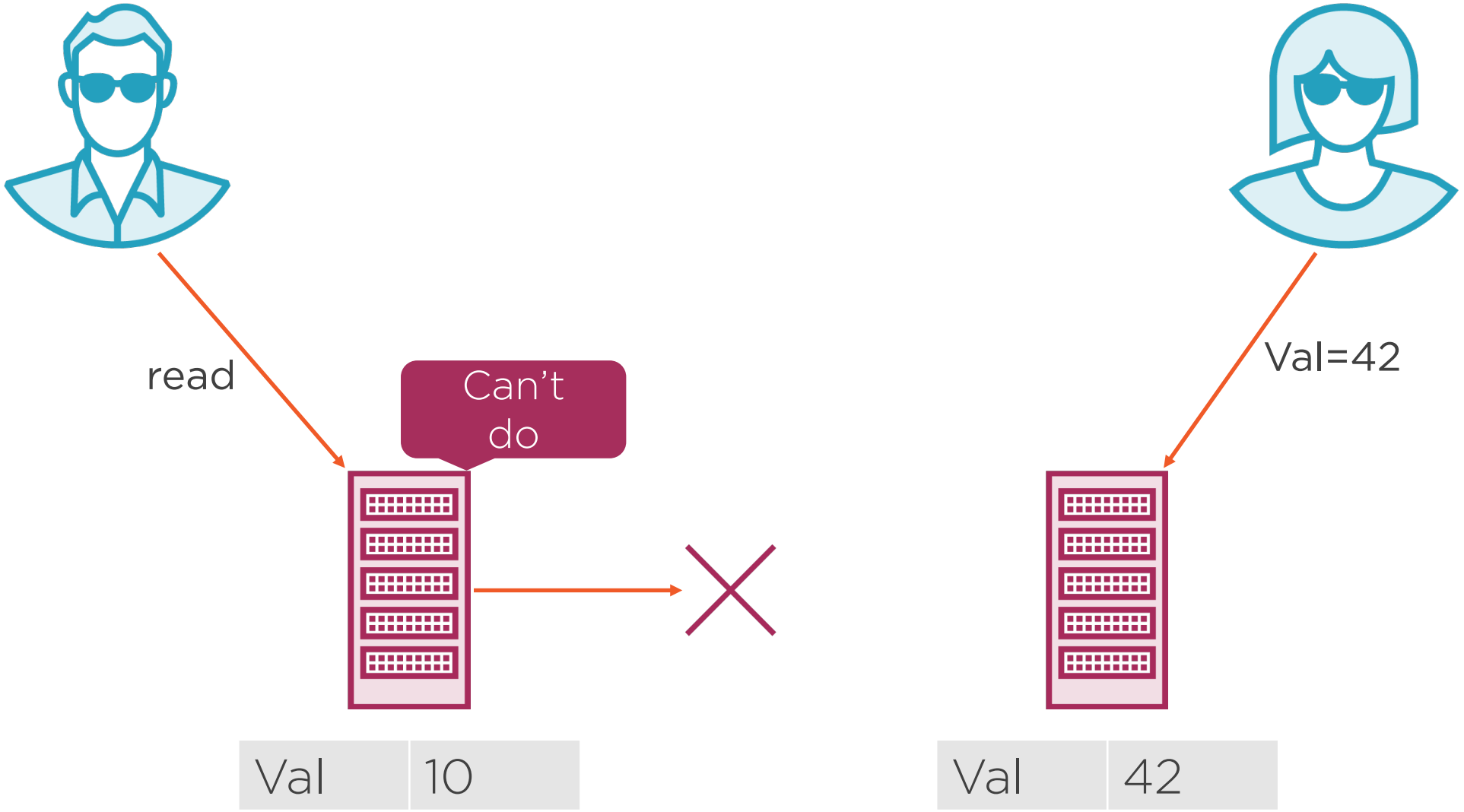
Network Partitioning



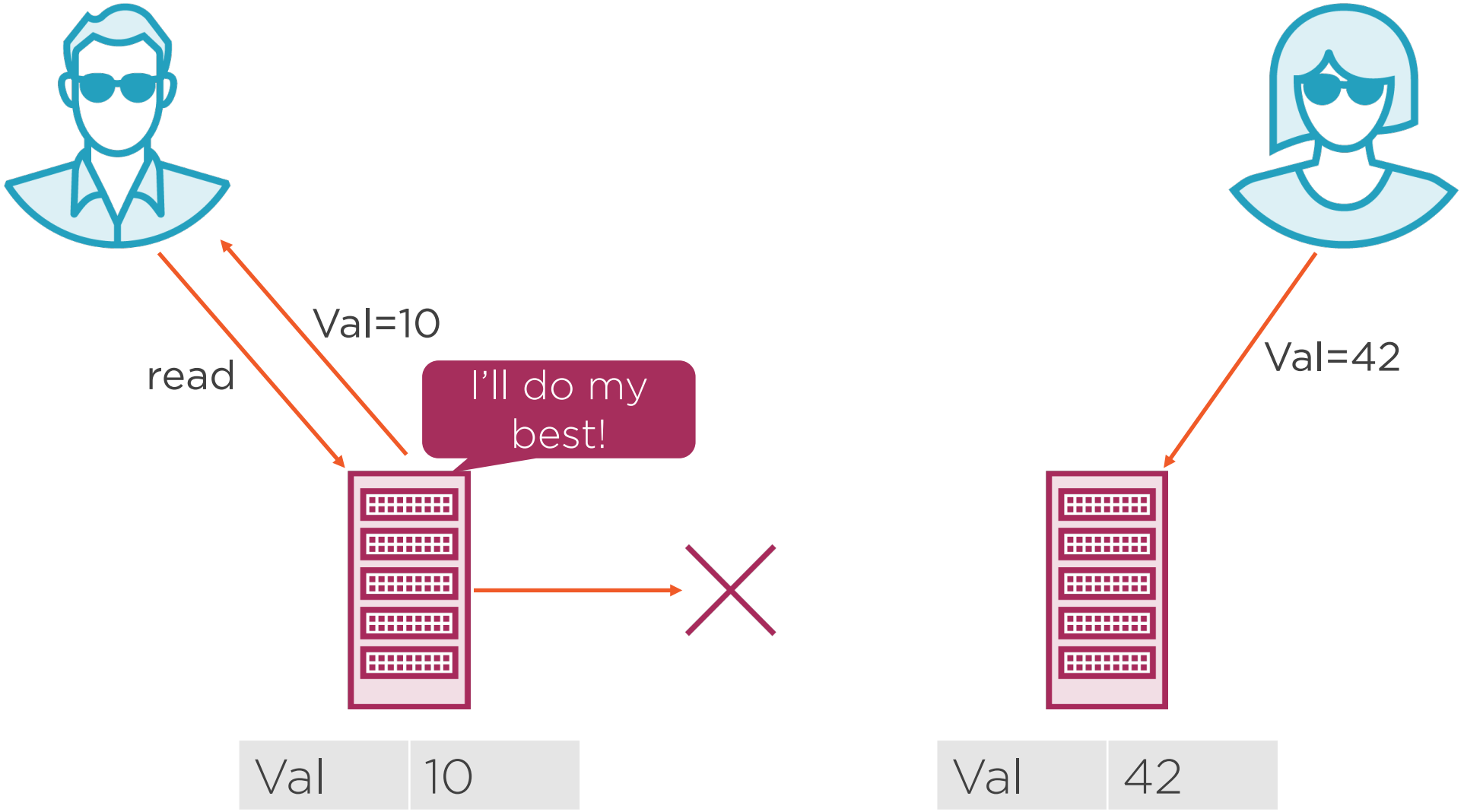
Network Partitioning



Select Consistency

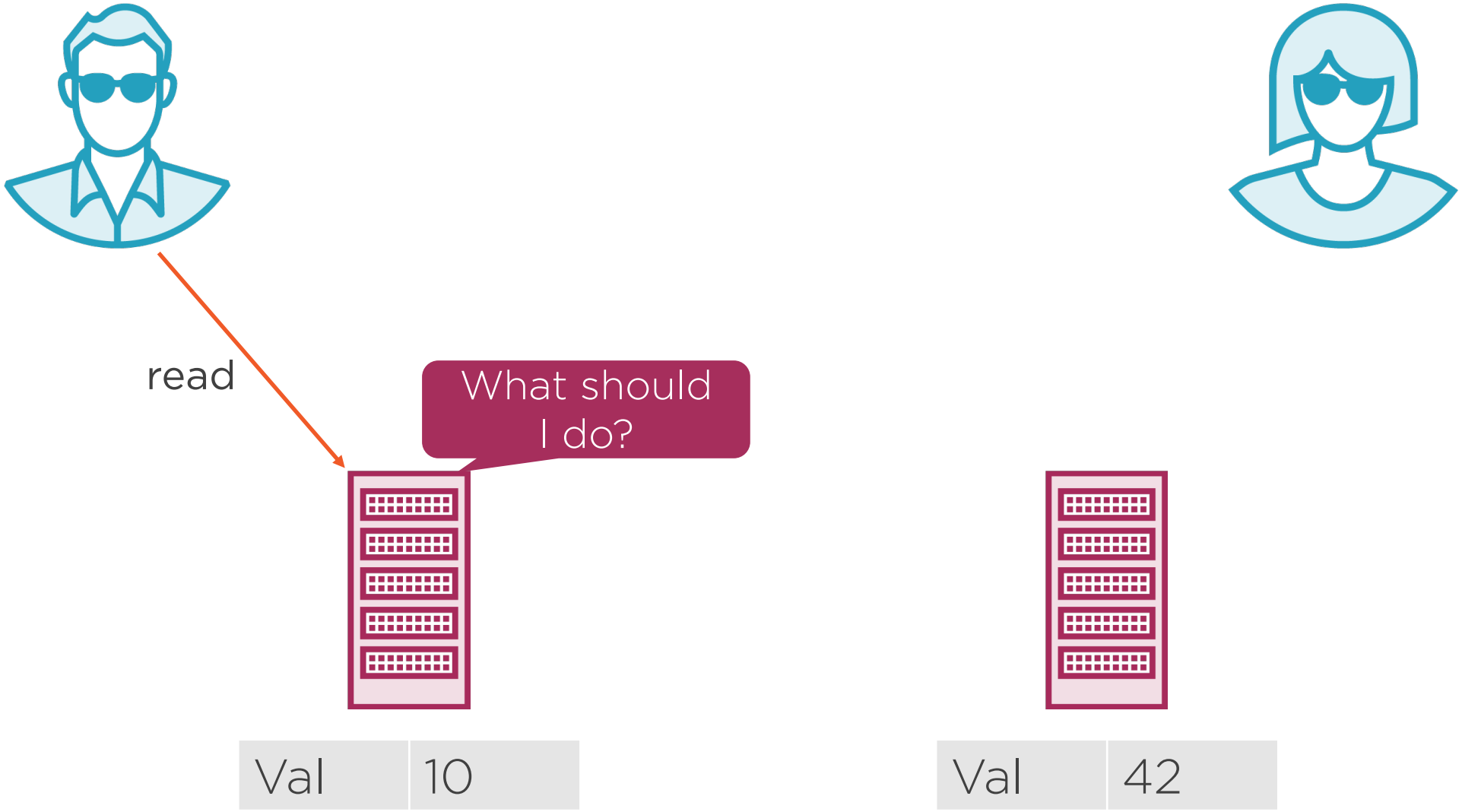


Select Availability

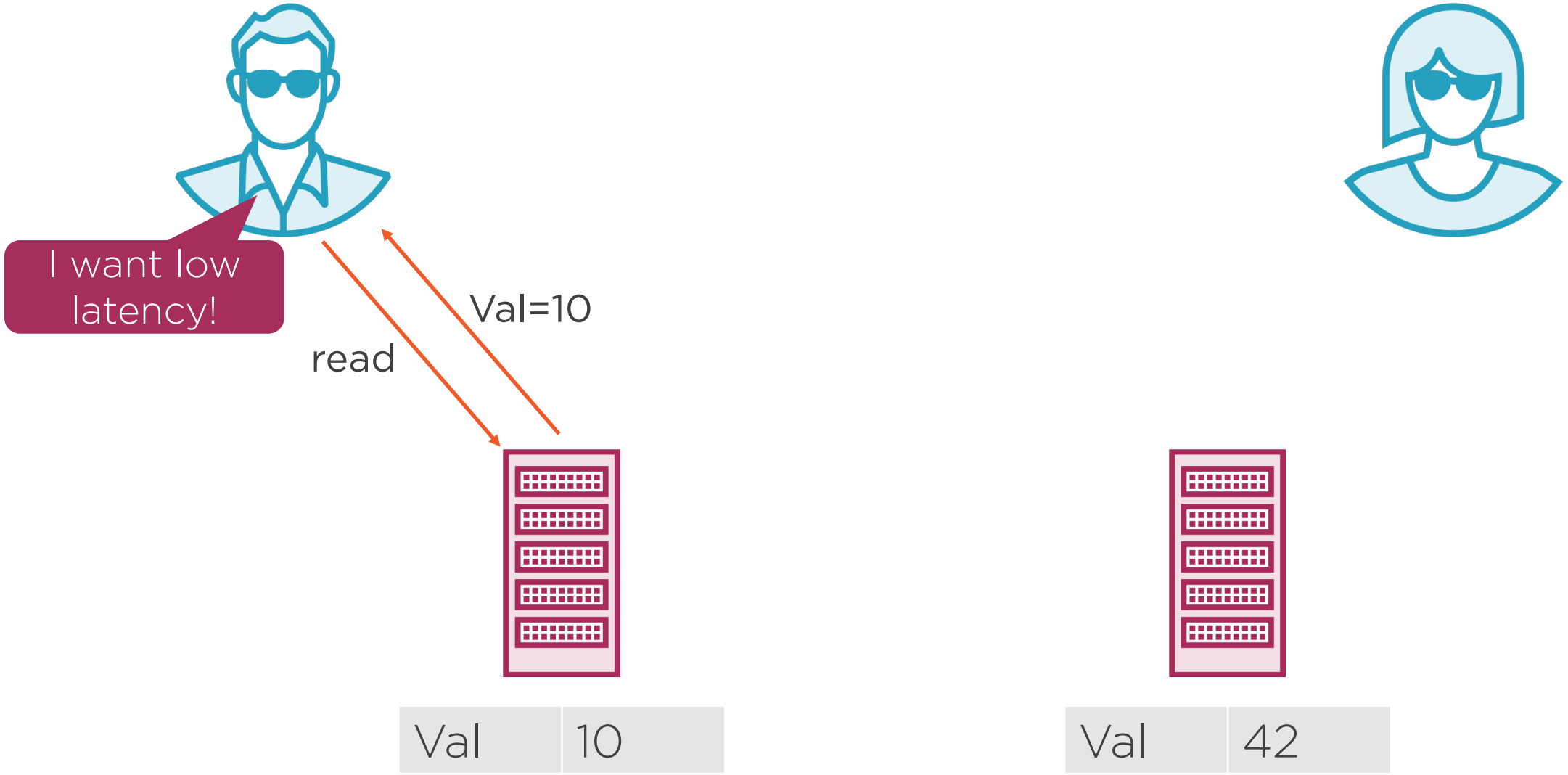


We cannot have both
Consistency and Availability
in a distributed system.

Consistency or Latency



Consistency or Latency



DynamoDB Features

Discuss DynamoDB features

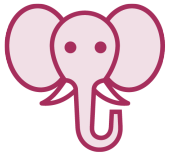
How DynamoDB is different

How DynamoDB integrates with other services

Usual Features

Key-value and document storage

Schemaless



High scale

Strong or weak consistency

Not so Usual Features

Low operations overhead

Simple API

Seamless scaling, predictable performance

Steams, triggers

DynamoDB Integrations

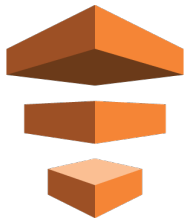
AWS Lambda

Amazon CloudWatch

Amazon CloudSearch

Amazon EMR

Amazon Redshift



AWS Data Pipeline

Demo

Set up an AWS user to access Dynamo

Necessary if you are going to follow examples

Summary

- Why learn DynamoDB
- SQL vs. NoSQL
- CAP theorem
- Main DynamoDB features
- Created a user to access DynamoDB
- Ready to start using DynamoDB