AWS State, Local, and Education Learning Days

Philadelphia

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aws Learning Days
State, Local, and Education

Serverless Architectures

Why is everyone moving to serverless?

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Learning Days
State, Local, and Education

Agenda

- Where we have come from
- Where to start with serverless
- Serverless architectures in practice

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Servers

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How do we use servers?

- State management
- Monolithic container for functionality
- One version, one server
- Server is an atomic unit of thinking
- Long-lived with well-known names

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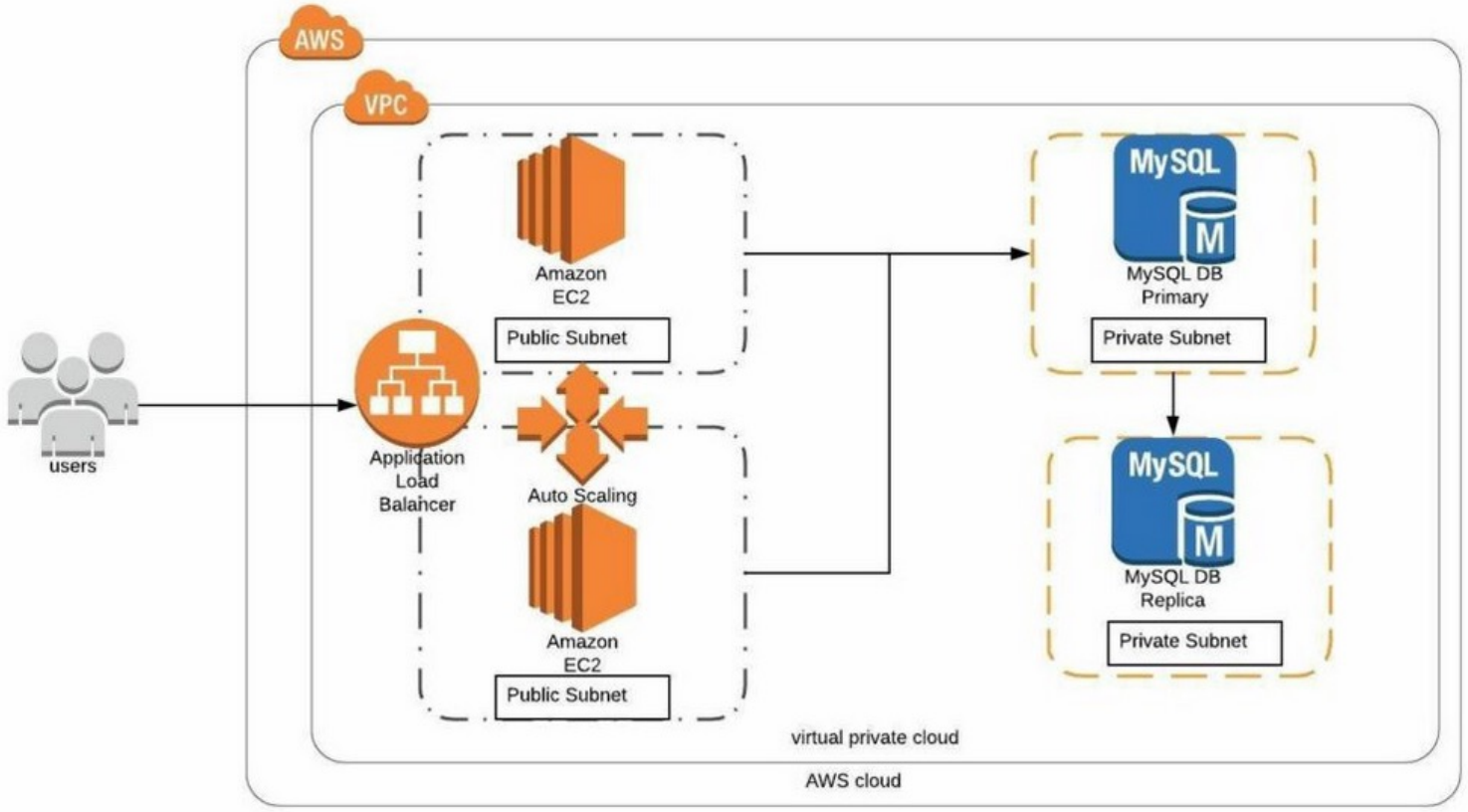
In the good old days there was one way (EC2)



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Today there are more choices!

AWS App Runner
Build and run production web applications at scale

Batch
Fully managed batch processing at any scale

EC2
Virtual Servers in the Cloud

EC2 Image Builder
A managed service to automate build, customize and deploy OS images

Elastic Beanstalk
Run and Manage Web Apps

Lambda
Run Code without Thinking about Servers

Lightsail
Launch and Manage Virtual Private Servers

AWS Outposts
Run AWS Services On Premises

Serverless Application Repository
Assemble, deploy, and share serverless applications within teams or publicly

Elastic Container Registry
Fully-managed Docker container registry : Share and deploy container software, publicly or privately

Elastic Container Service
Highly secure, reliable, and scalable way to run containers

Elastic Kubernetes Service
The most trusted way to start, run, and scale Kubernetes

Red Hat OpenShift Service on AWS
Fully managed Red Hat OpenShift service on AWS

Customers love that they can pick the right tool for the job but that comes with some decision fatigue

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Where to start with serverless

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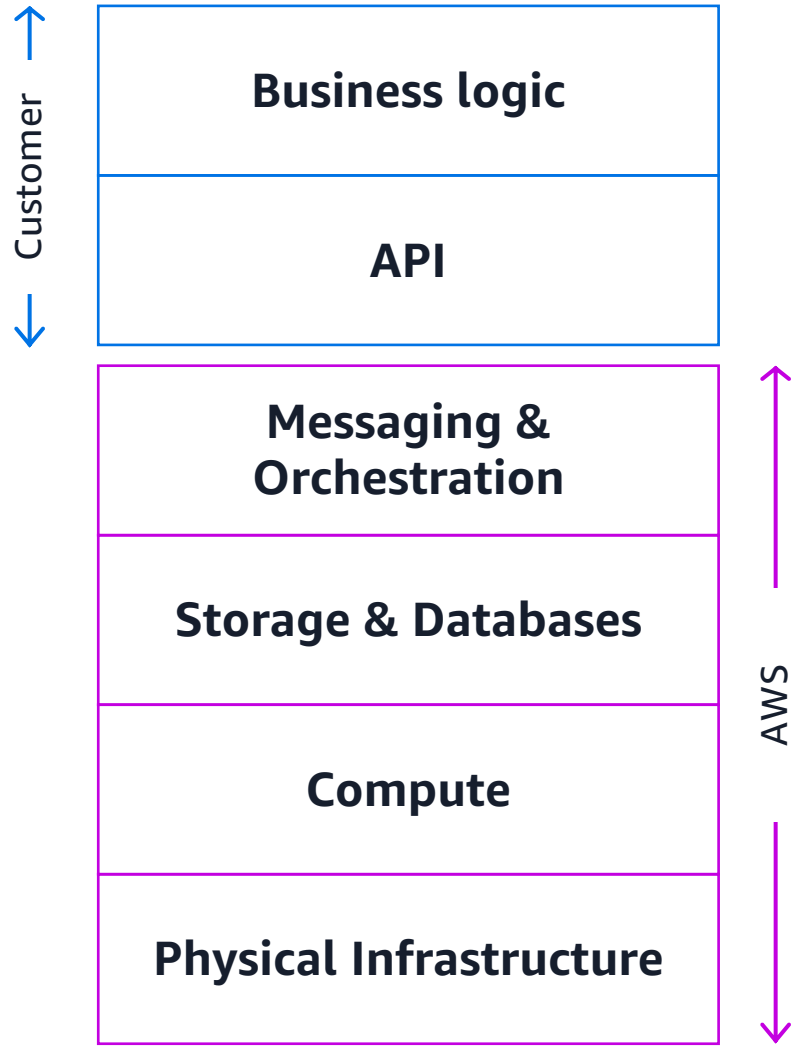
What is serverless?

Serverless services simplify the management and scaling of cloud applications by shifting undifferentiated operational tasks to the cloud provider so development teams can focus on writing code that solves business problems



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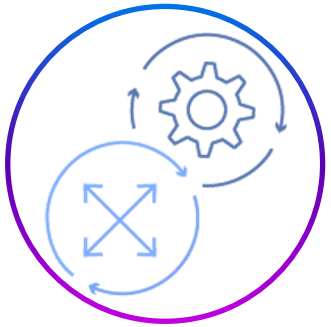
General approach to thinking serverlessly

Features first

Avoid monolithic thinking



Focus on events

Events are triggers that cause action

Statelessness

The key to scaling effectively

Data flow

Make data decisions early on

Use the services

Don’t reinvent the wheel

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What are serverless services?

Amazon EventBridge

Amazon Simple Notification Service

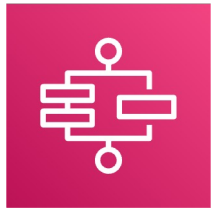
Amazon Simple Queue Service

Amazon API Gateway

Amazon DynamoDB

AWS Lambda

Amazon S3



AWS Step Functions

Amazon Kinesis

AWS IoT Core

Amazon Elastic Transcoder

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Integrating with other AWS services

Amazon Bedrock

Amazon Rekognition

Amazon Comprehend

Amazon Textract

Amazon Transcribe

Amazon Translate

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How AWS Lambda fits in

Attributes

- Runs your code on demand
- Supports many languages (runtimes)
- Responds to events
- Stateless
- Automatically scales

Best practices

- Avoid lifting-and-shifting
- 1 Lambda function per purpose
- Keep functions small
- Choose the right runtime
- Use functions for business logic and plumbing between services
- Include security

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Good serverless practices

- Infrastructure is disposable
- Asynchronous versus synchronous processing
- Mix and match runtimes
- Security still top priority
- Automation – deploy with Infrastructure as Code (IaC)
  - AWS Serverless Application Model (AWS SAM)
  - AWS Cloud Development Kit (CDK)
  - Serverless framework

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Whiteboarding

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Form Upload

Create a serverless application to support a student feedback form submitted from a webpage

- Only allow signed-in students to post feedback
- Incoming responses must be translated into English
- Allow user to upload image with a response
- Email any negative comments immediately

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Lab room reservations

Create a serverless application to allow students to reserve a lab room by SMS text message

- Add a display showing upcoming reservations in real time
- Speak the name of a student when ready
- Send a daily reservation email report
- Alert a legacy application when reservations are made

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Social web application

Create a serverless web application to support a national outreach application

- Ensure fast performance for visitors in multiple Regions
- Allow users to create accounts (including social login)
- Support uploading and serving user videos
- Let users 'like' videos and receive updates

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Wrap up

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Additional resources

Serverless on AWS

ServerlessLand

AWS Lambda

Serverless Databases

Aurora Serverless

ML inferencing with serverless

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Thank you!

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Please complete the survey for this session

Application modernization, security, and governance

Serverless architecture - why is everyone moving to serverless?

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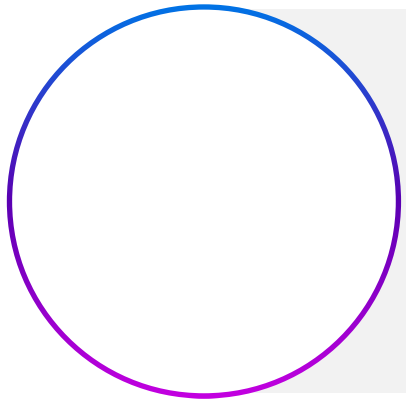

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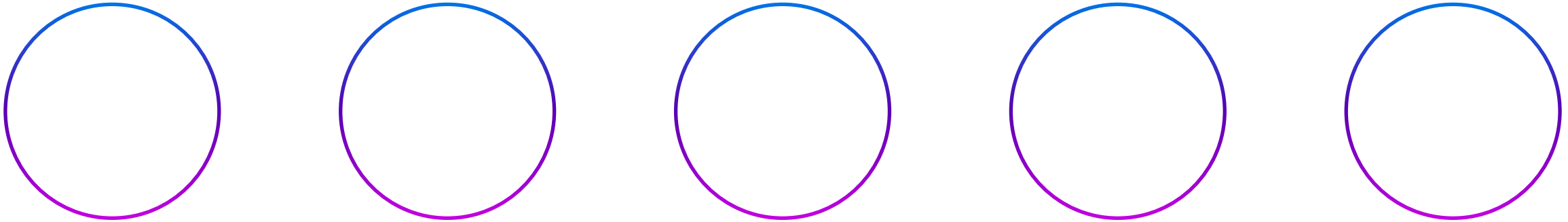

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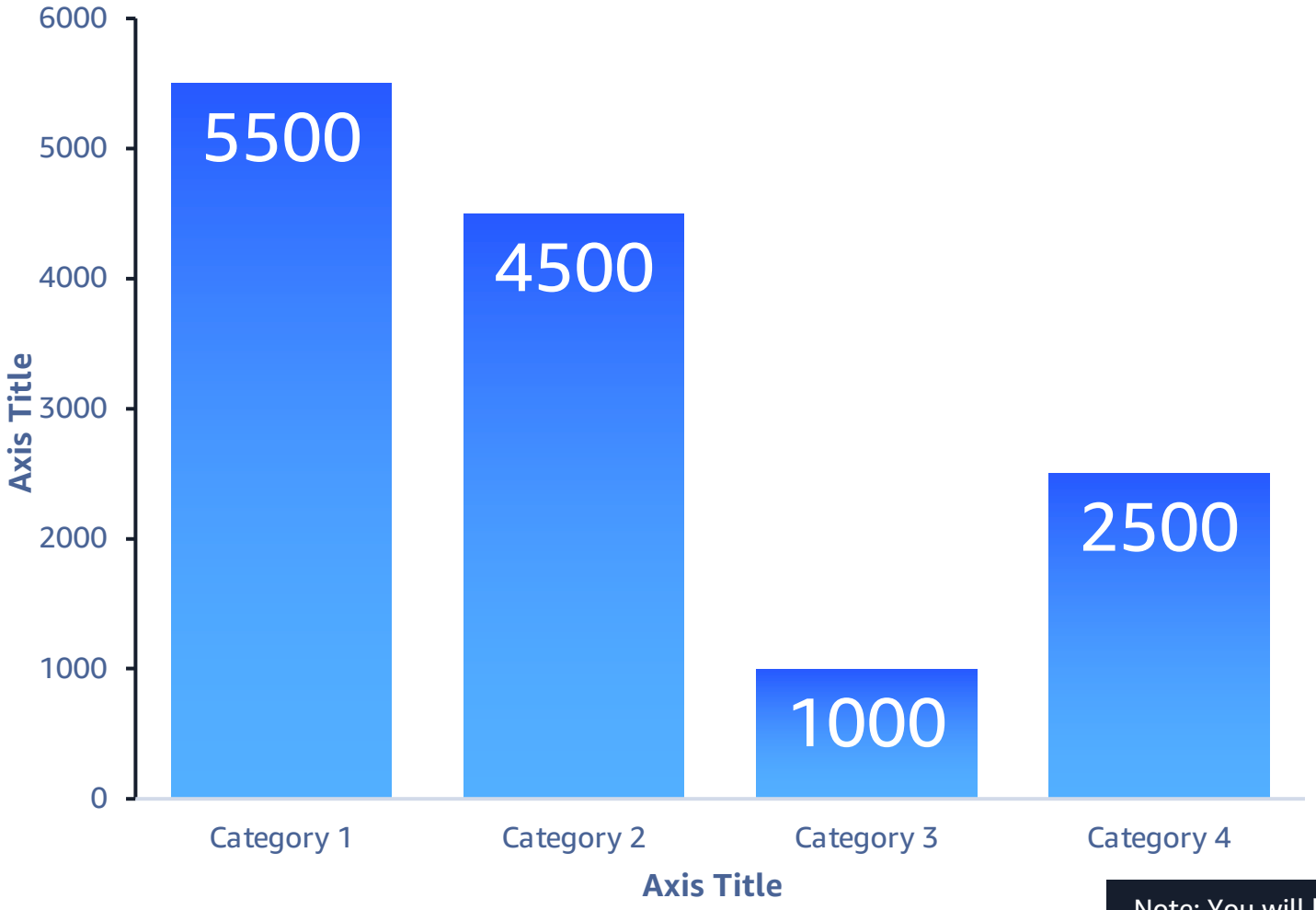
Comparison

To update the chart:
Select the graph then choose the menu option on the far right of the tool bar at the top “Chart Design” > “Edit Data”. Bar height, spacing, and some axis labels will automatically adjust. See more info in this Microsoft article.



Main point

Full-sentence description of relationship between data points. Description may be multiple sentences in length.

237%

Note: You will have to decrease the font size of the above percentage if you are going over three digits.

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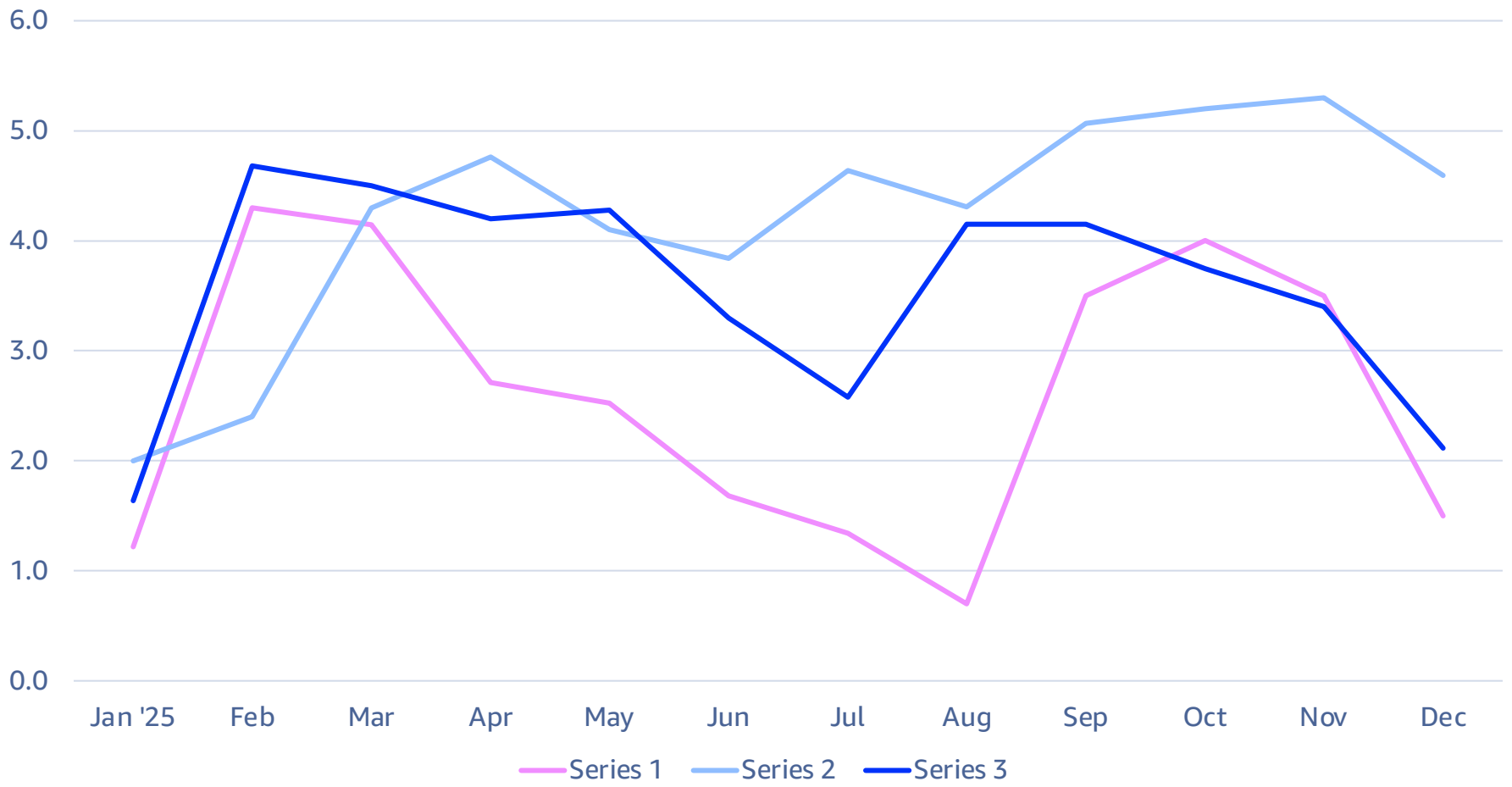
Trends

To update the chart:
Select the graph then choose the menu option on the far right of the tool bar at the top “Chart Design” > “Edit Data”. See more info in this Microsoft article.



Main point

Full-sentence description of data points.

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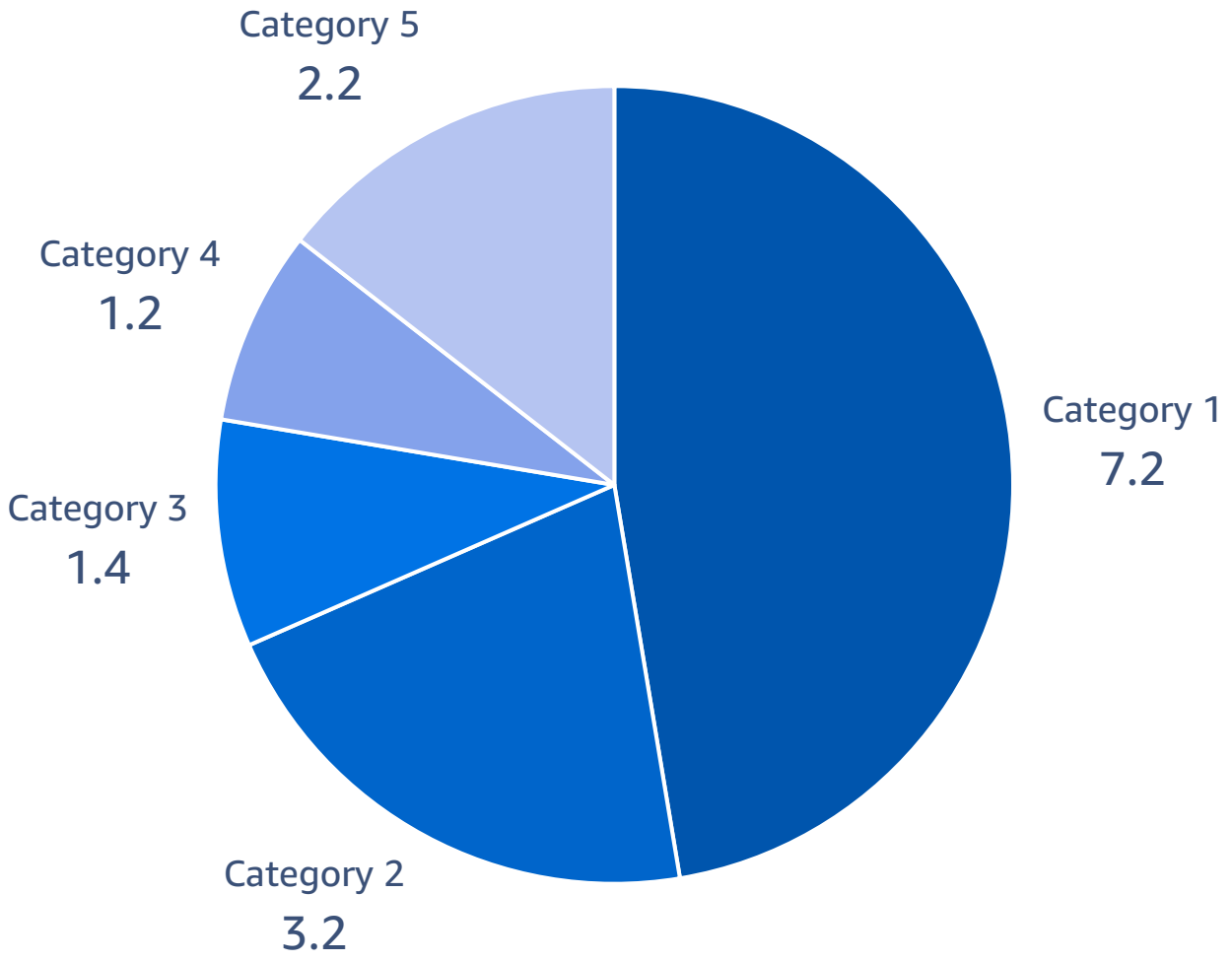
Parts of a Whole

To update the chart:
Select the pie graph, then choose the menu option on the far right of the tool bar “Chart Design” > “Edit Data”. To change the color, double click the slice you want to change which will bring up a side bar on the right. Click the paint bucket > color > select what color you want to update it to. We recommend staying in the blue palette. The size, proportion, and labels of the slices will automatically adjust. See more info in this Microsoft article.

Main point

Full-sentence description of data points.



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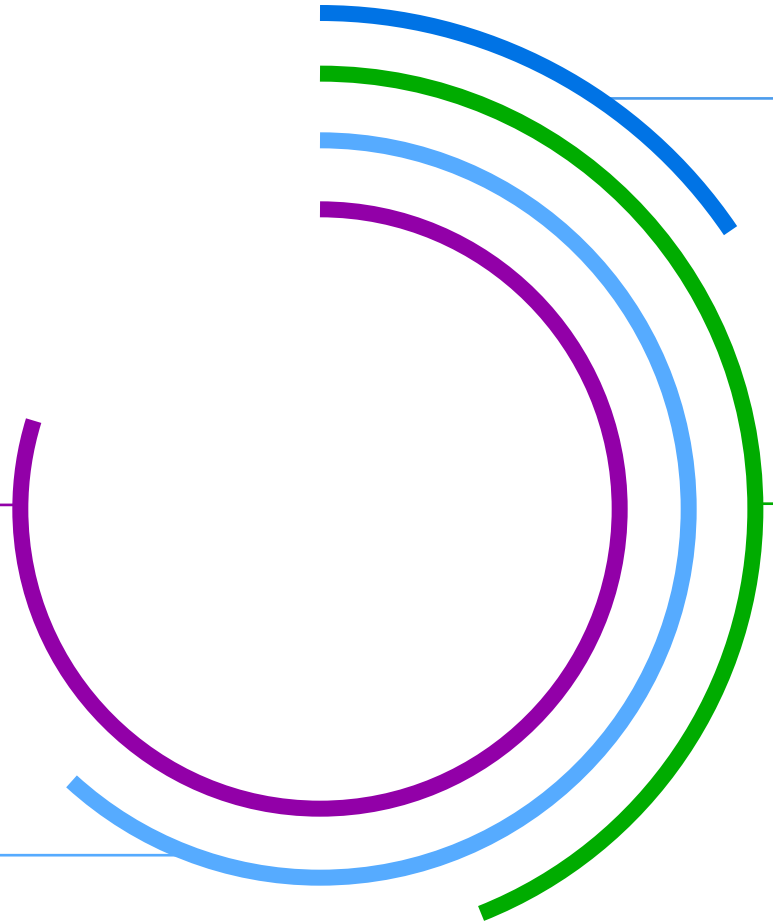
Parts of a Whole

To change the percentage depicted:

Select an arc and drag the yellow dot to make the arc longer or shorter (do NOT resize with the white handles/dots). Use visual judgement to approximate the percentage. **Note:** arcs should get longer as they approach the center (i.e., pink depicts a greater percentage than orange). You may need to reposition the data labels (click label, drag to reposition) to make sure they are connected to their corresponding arcs.



00%

Short description of statistic

00%

Short description of statistic

00%

Short description of statistic

00%

Short description of statistic

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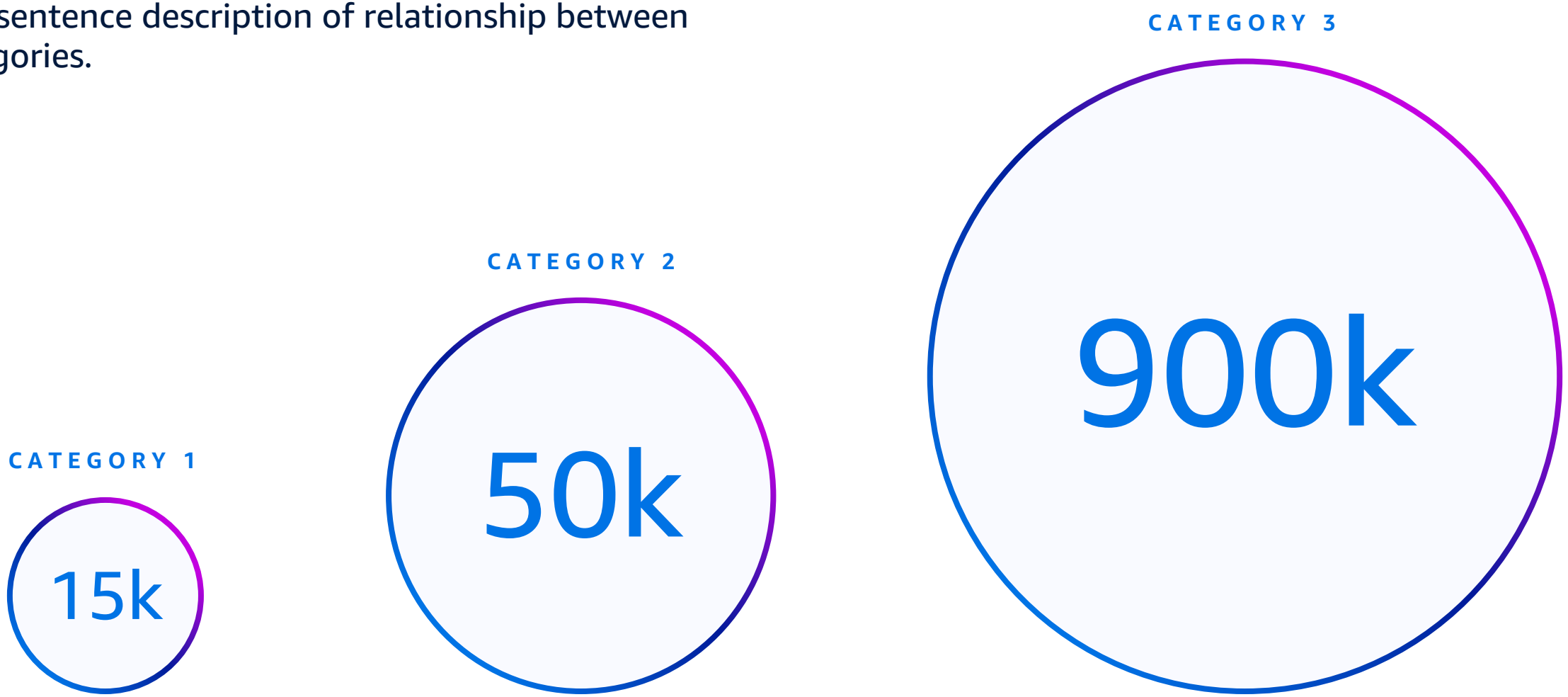
Comparisons

To center the category label above the data circle:

To keep the "Category" labels centered, hold shift and select the circle you want to adjust and its corresponding category label. Then choose the menu option on the far right of the tool bar “Shape Format” > “Align” > “Align Center”. **To align all three circles on the same baseline:** Hold shift and select all three circle. Then choose the menu option on the far right of the tool bar “Shape Format” > “Align” > “Align Bottom”.

Full-sentence description of relationship between categories.



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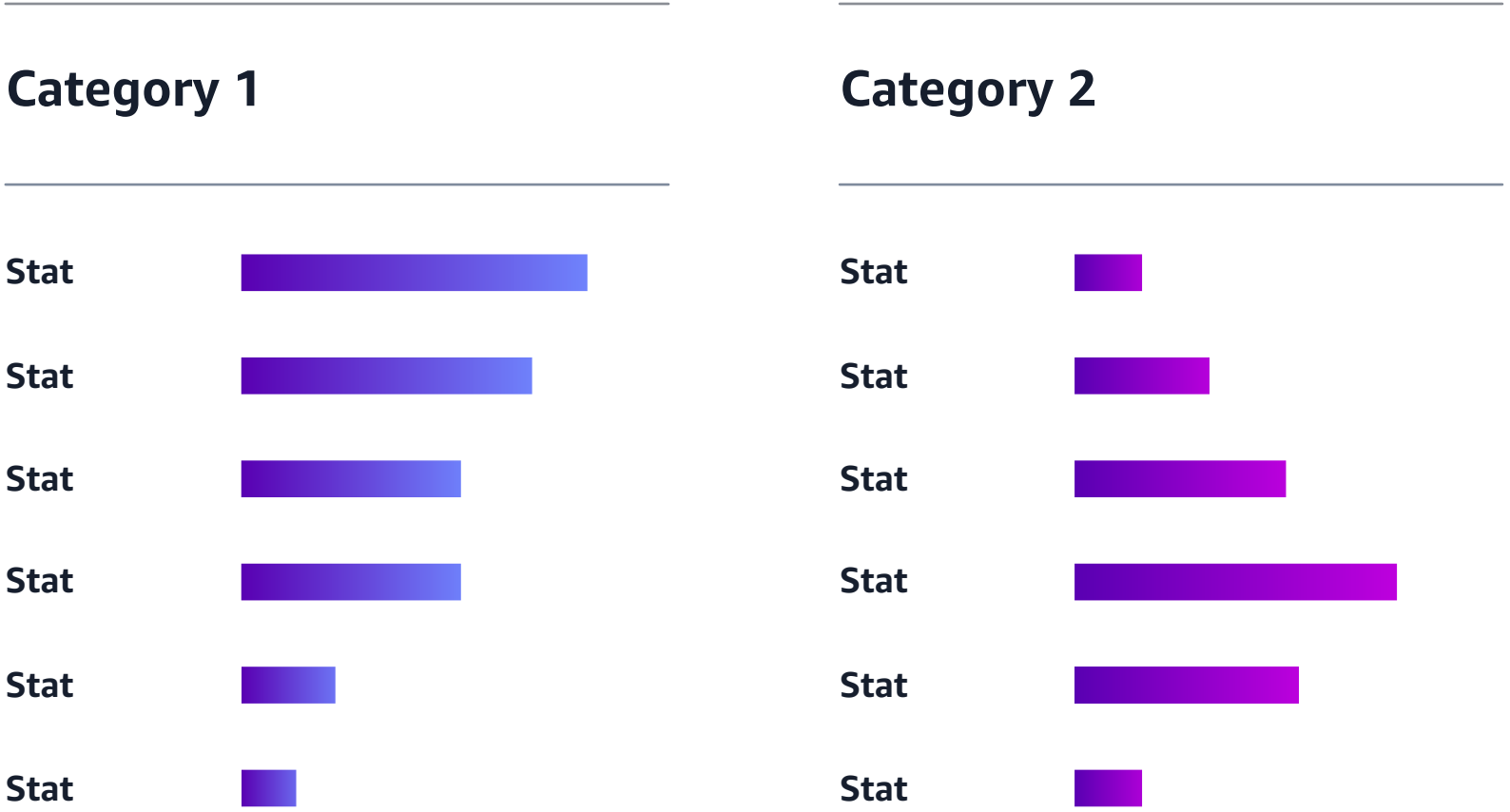
Comparisons

To resize bars:

Click on one of the horizontal bars, hold shift, select the white dot, and drag to be the approximate relative proportion.

Note: holding down “Shift” when resizing keeps them flat horizontally.

Full-sentence description of relationship between categories.



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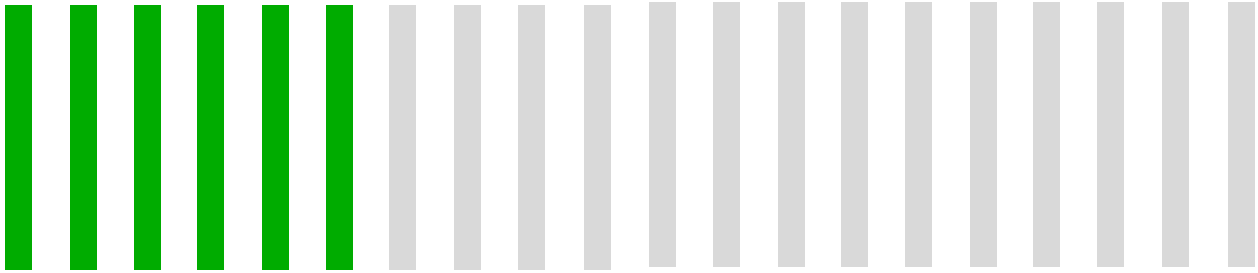
Comparisons

How this graph works:
Both rows have 20 bars, each representing 5%. Round to the nearest 5% of your stat and fill in the appropriate number of bars with the orange or gold color.

How to recolor bars:
Select the bar you want colored (if you want to color multiple, hold shift and click on all the bars you want to recolor) then choose the menu option on the far right of the tool bar “Shape Format” > “Shape Fill” paint bucket, select appropriate color by selecting “Eyedropper” and select a point on one of the colored lines to get the same hue.

00% **statistic description**



00% **statistic description**

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Maps

To resize, reposition, or duplicate circles:

Resize: Select circle and drag on white handles/dots to adjust size.

Reposition: Select circle and drag to new place on the map.

Duplicate: Click circle and then copy / paste. Click on newly pasted circle and reposition as needed. Make sure to only select the circle and not the map image when moving.

Do not move or recolor map.

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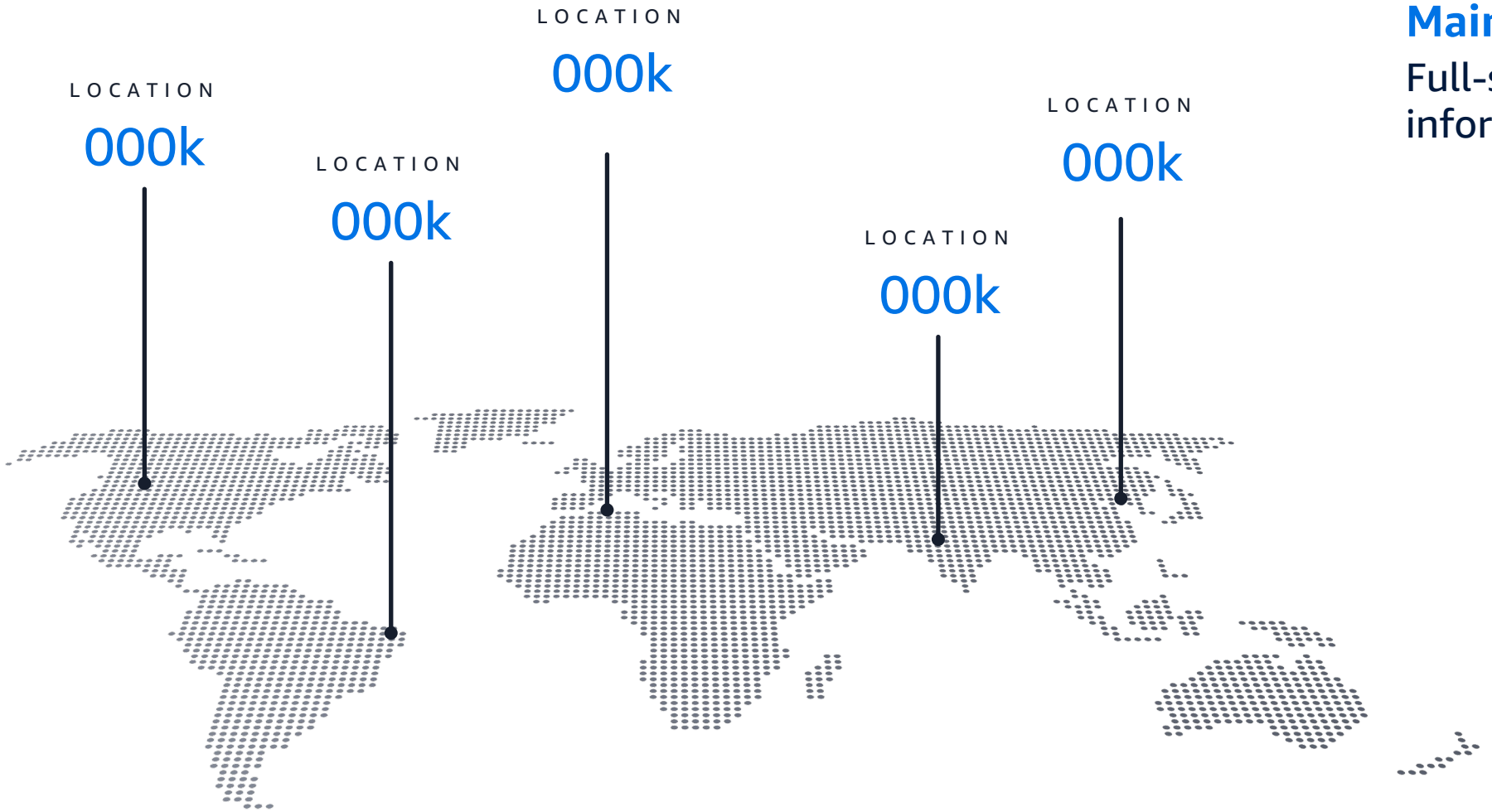
Maps

To update text and move markers as needed:

Hold shift and click on the white line and the text box above the line to move them together. The map is somewhat abstracted, so location need not be precise.



Main point

Full-sentence description of information conveyed by map.

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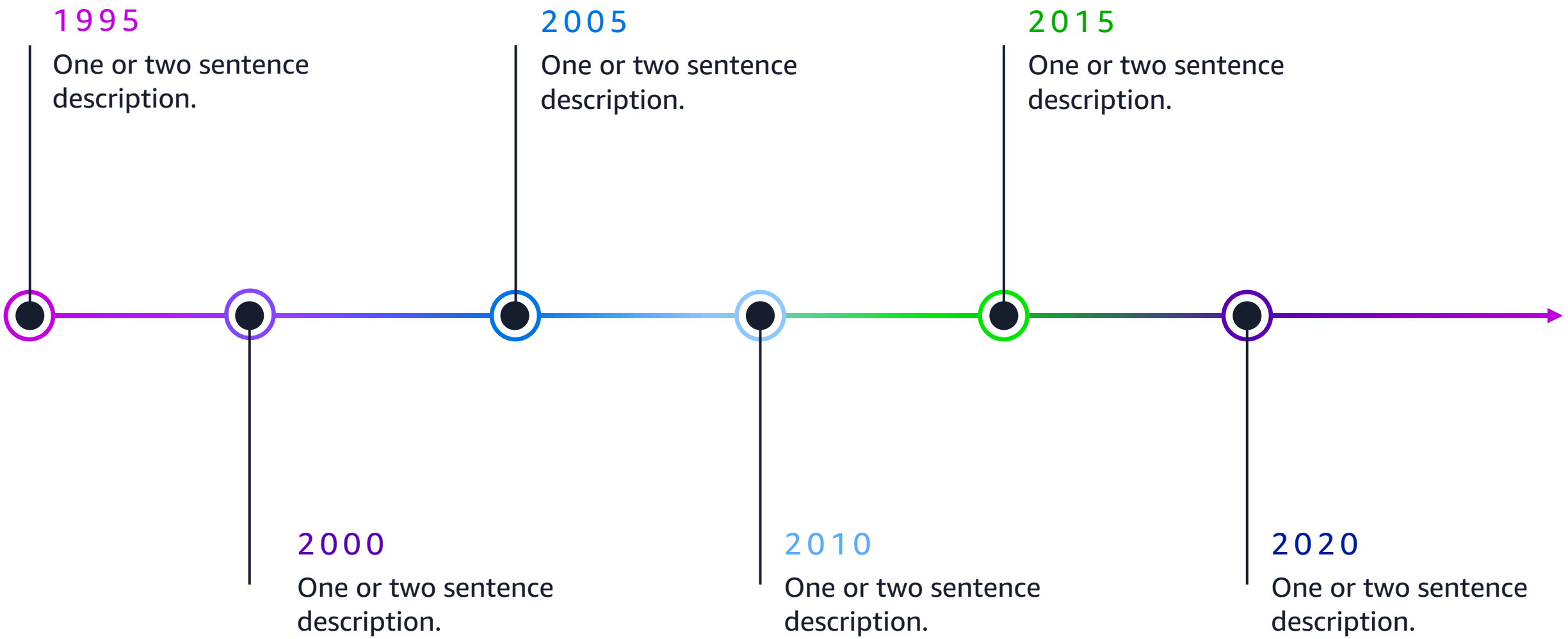
Journey

To shift date points:

Hold shift and select one of the white lines (which has a white dot with it) and the corresponding outline circle (colored) and then drag to a new position. To recolor the outline circle to match the new placement on the gradient line, select only the outline circle, choose the menu option on the far right of the tool bar “Shape Format” > “Shape Outline” > “Eyedropper” and select a point on the gradient line near the circle to match the color.



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Journey

Have overlapping events?

To suggest a journey step to continue past a later step, you can adjust the length of the bars.

To adjust the length of the bars:

Select the rectangle shape, click and drag white dot on the right to extend the length.

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Typographic

To update data numbers:

Select number text box and type in relevant data stat.

Depending on how many numbers you need to depict for each stat, you might need to decrease font size to fit.

00

Longer, full-sentence description of number or statistic

00%

One/two-word description

00M

Longer, full-sentence description of number or statistic

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Typographic

To update data number:

Select number text box and type in relevant data stat.

00k

Description

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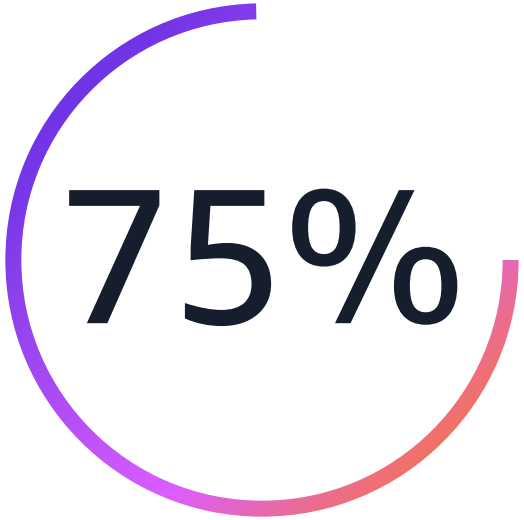
Typographic

To change the percentage depicted:

Select one of the gradient arcs and drag the yellow dot to make the arc longer or shorter (do NOT resize with the white handles/dot).

Use visual judgement to approximate the percentage.



Description of number or statistic

Description of number or statistic

aws

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