
AWS
re:Invent

NET203

Demystifying data transfer on AWS

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AWS

AWS re:Invent

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Agenda

AWS global network

What is data transfer?

How to understand data transfer in your account

Tips to optimize your data transfer



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Understanding data transfer



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AWS global network

AWS CURRENTLY OPERATES 24 REGIONS AND 77 AVAILABILITY ZONES GLOBALLY



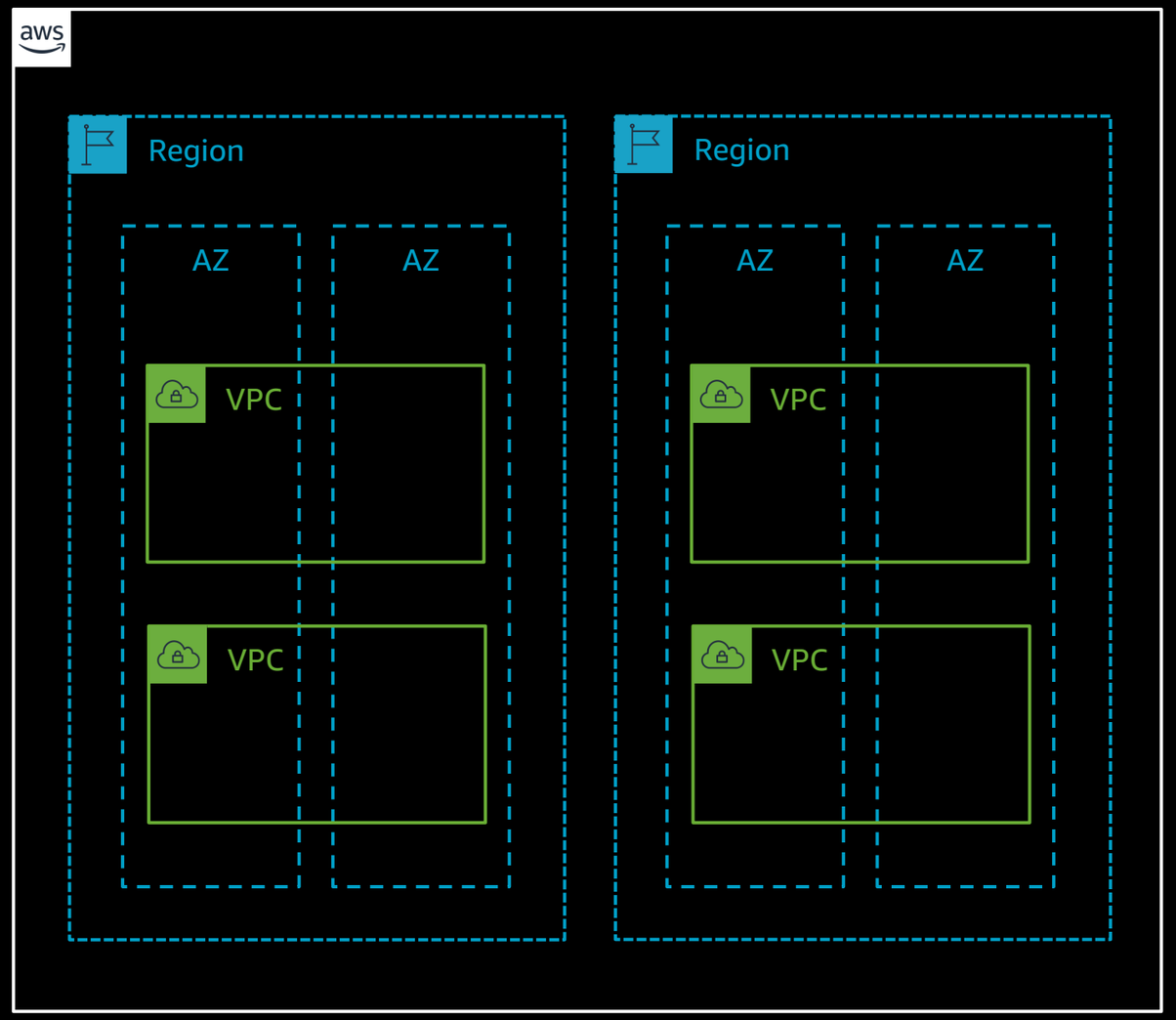
AWS networking concepts

Data transfer happens at various boundaries of the AWS network

The AWS network is made up of 24 Regions; Regions are connected by the backbone of the AWS global network

Regions are subdivided into Availability Zones (AZs), of which there are 77 worldwide; within a Region, AZs are interconnected over very fast low-latency connections, but they're physically distanced to enable high availability

Most AWS resources are deployed into virtual private clouds (VPCs), which are regionally scoped and logically isolated environments

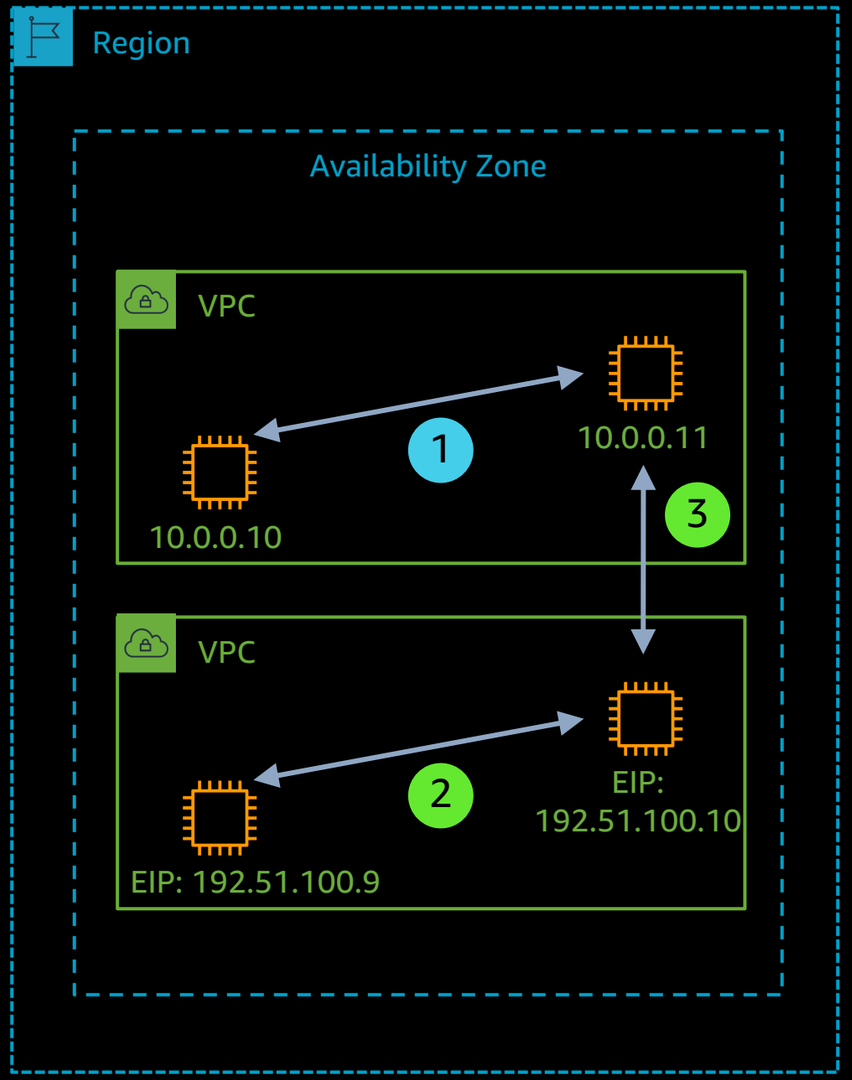


Data transfer within an Availability Zone

1. Communication between resources using private IPs in the same AZ is generally $0.00 per GB

2. Data sent to and from Public / Elastic IP addresses is charged per GB

3. Communication between peered VPCs or public subnets in different VPCs is charged per GB

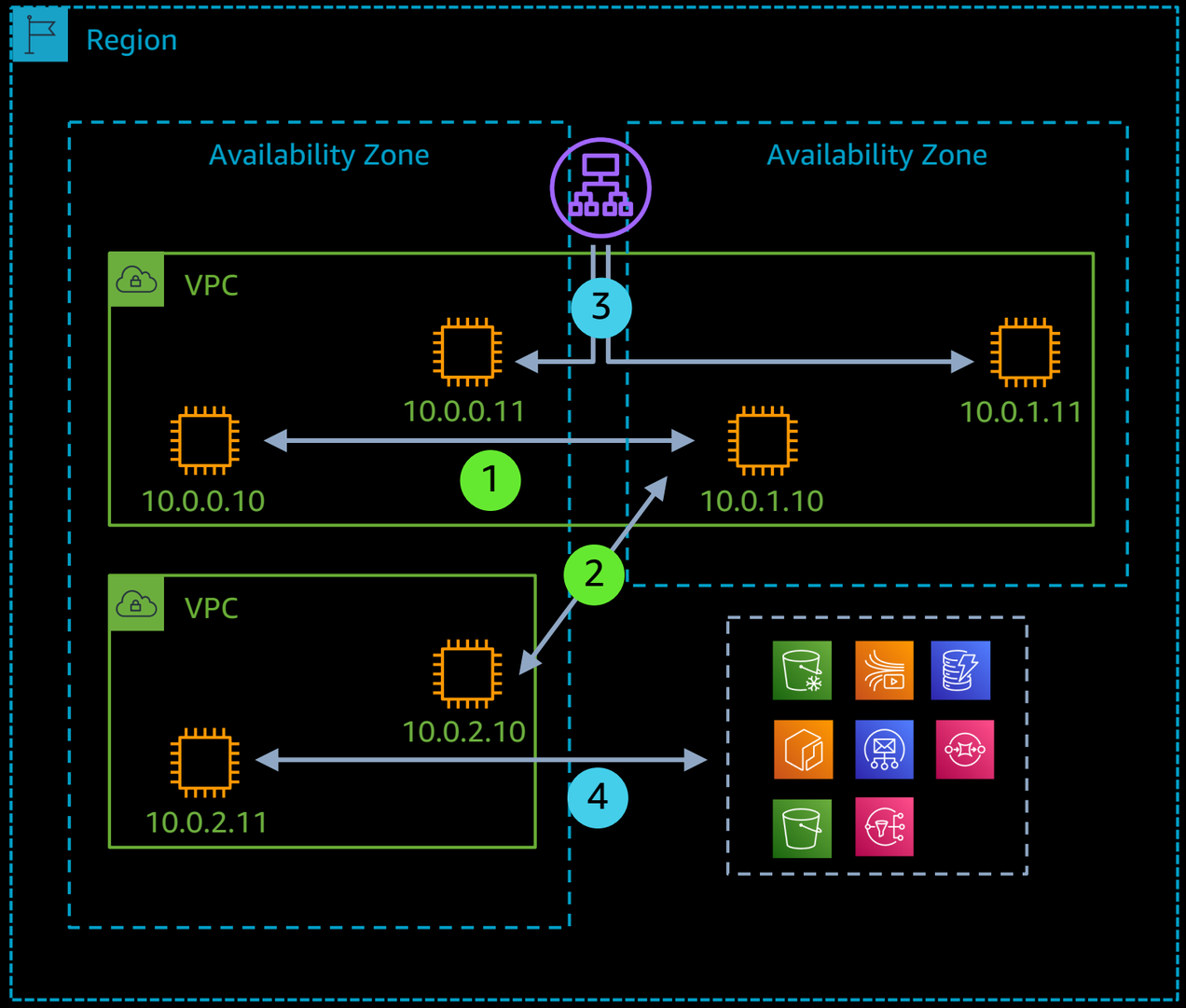


For more information about data transfer pricing and variables that can affect it, see https://aws.amazon.com/ec2/pricing/on-demand/

Data transfer within a Region

Regions are made up of two or more Availability Zones

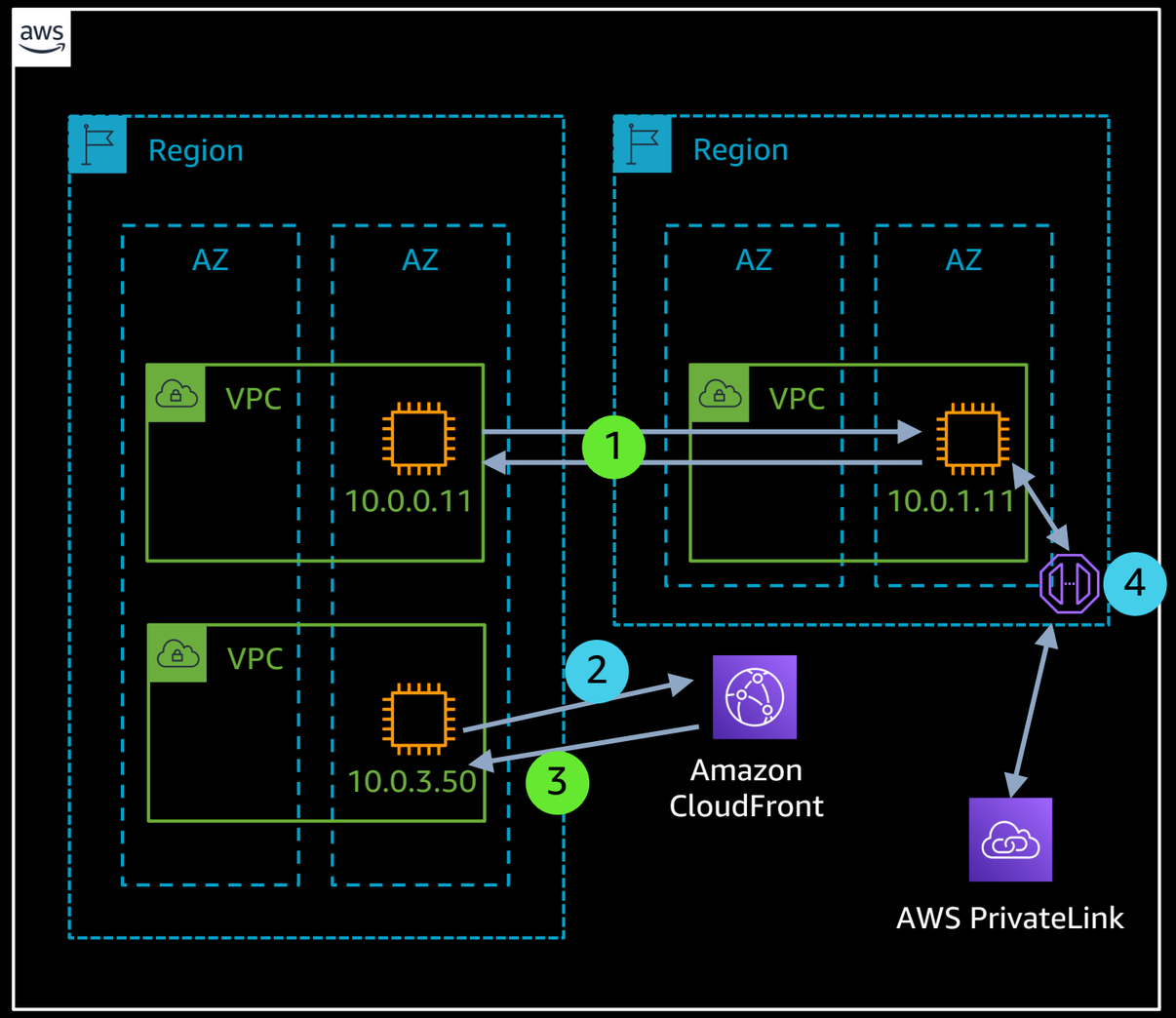
1. Data transferred between AZs is charged per GB in each direction
2. Communication between peered VPCs or public subnets in different VPCs is charged per GB
3. Data sent to and from an Application Load Balancer (ALB) – even across AZ boundaries – is $0.00 per GB within the same Region; ALB hourly and load balancer capacity unit (LCU) charges still apply
4. Data to and from Amazon S3, S3 Glacier, Amazon DynamoDB, Amazon SES, Amazon SQS, Amazon Kinesis, Amazon ECR, Amazon SNS, and Amazon SimpleDB from Amazon EC2 is $0.00 per GB within a Region



For more information about data transfer pricing and variables that can affect it, see https://aws.amazon.com/ec2/pricing/on-demand/

Data transfer out from Regions

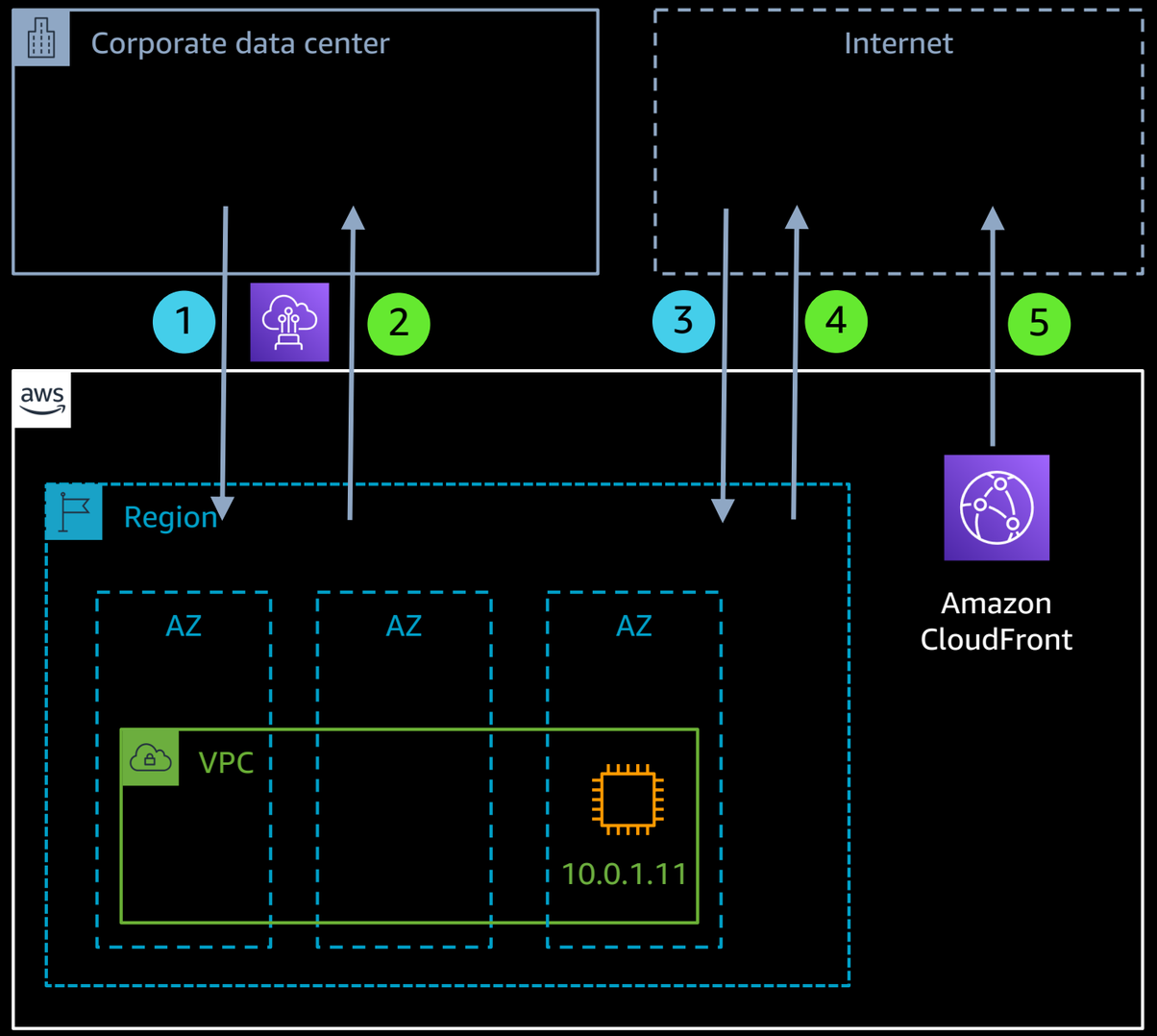
1. Data transferred from EC2 in one Region to another AWS Region is charged per GB
2. Data sent from EC2 to Amazon CloudFront is $0.00 per GB
3. Data sent from Amazon CloudFront back to EC2 origins is charged per GB
4. Data sent to and from a PrivateLink endpoint in a Region is $0.00 per GB; however, AWS PrivateLink usage charges apply



For more information about data transfer pricing and variables that can affect it, see https://aws.amazon.com/ec2/pricing/on-demand/

Data transfer out of AWS

1. Data transferred into AWS via AWS Direct Connect is $0.00 per GB
2. Data transferred out of AWS via AWS Direct Connect is charged per GB
3. Data transferred into AWS from the internet is $0.00 per GB
4. Data sent out of AWS via the internet is charged per GB
5. Data sent out to the internet from CloudFront is charged per GB



For more information about data transfer pricing and variables that can affect it, see https://aws.amazon.com/ec2/pricing/on-demand/

Managing data transfer



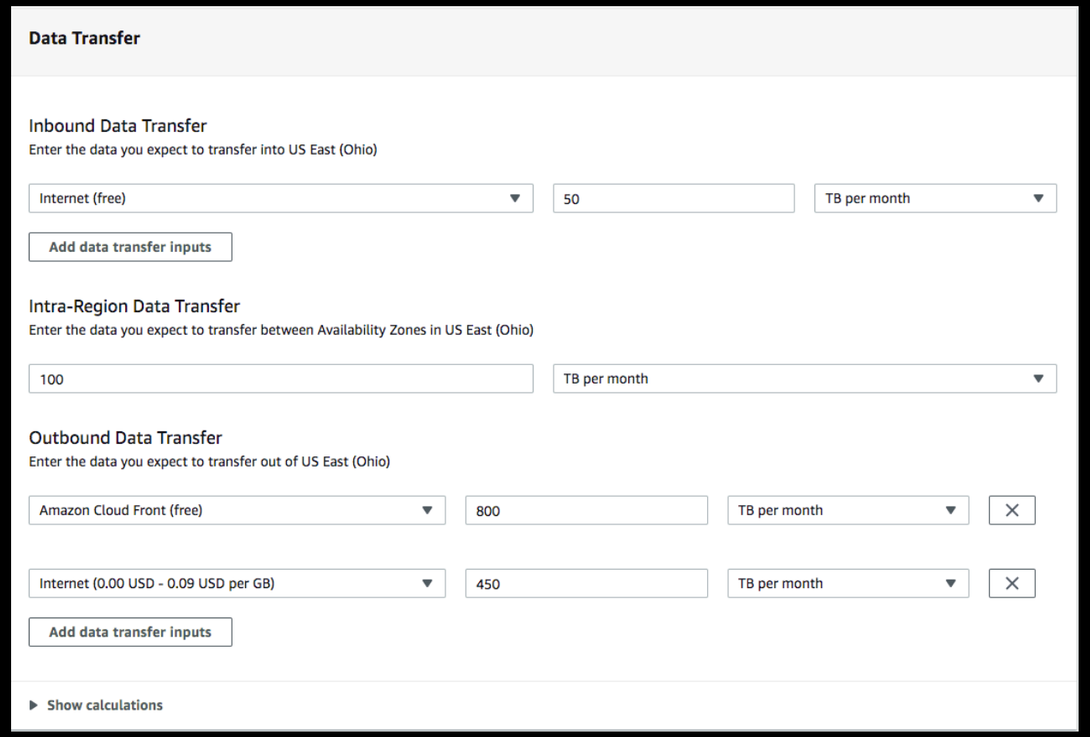
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Estimate your data transfer costs

Use the AWS Pricing Calculator: https://calculator.aws

- Create a new estimate
- EC2 data transfer is part of VPC
- Choose the region for your configuration
- Select the **AWS Data Transfer** category

Add estimates for data volumes and type, and the calculator will show you a cost breakdown



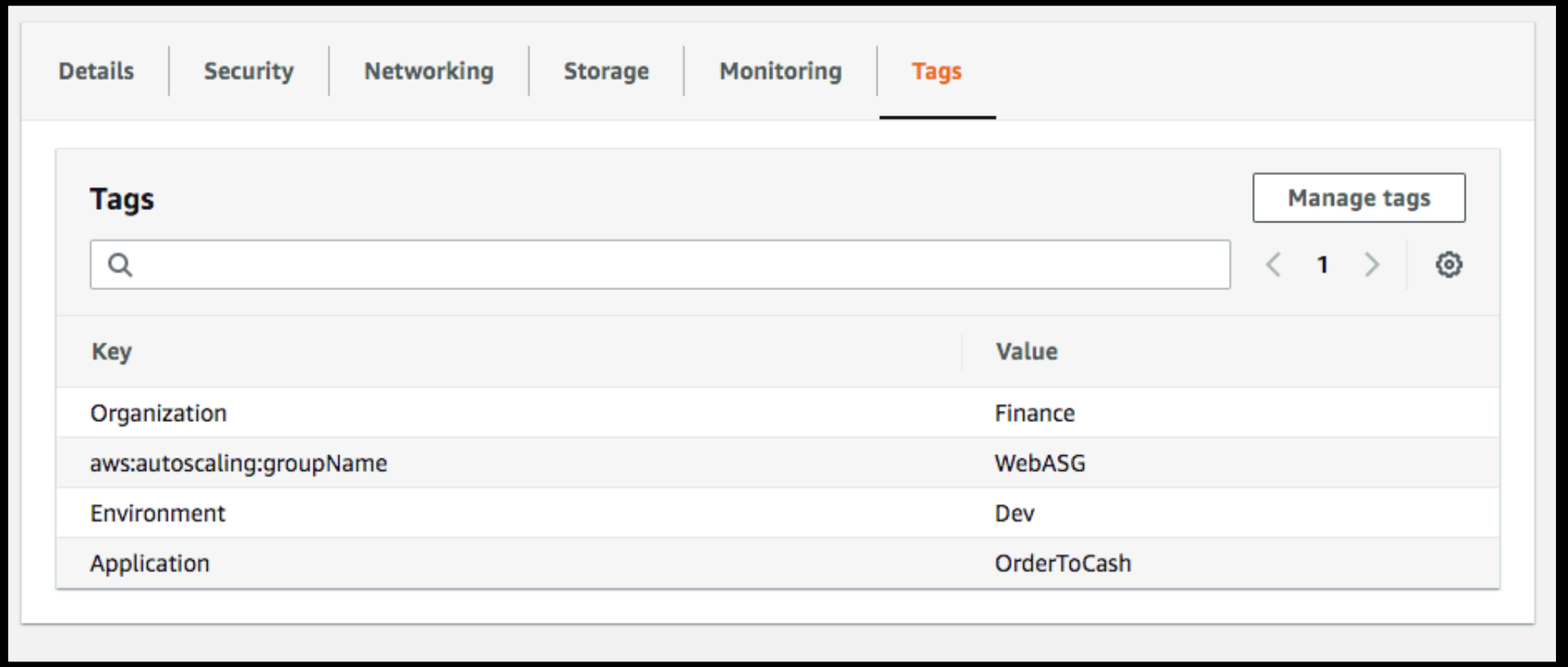
Visualize data transfer cost with Cost Explorer

Step 1: Configure cost allocation tags to categorize your resources







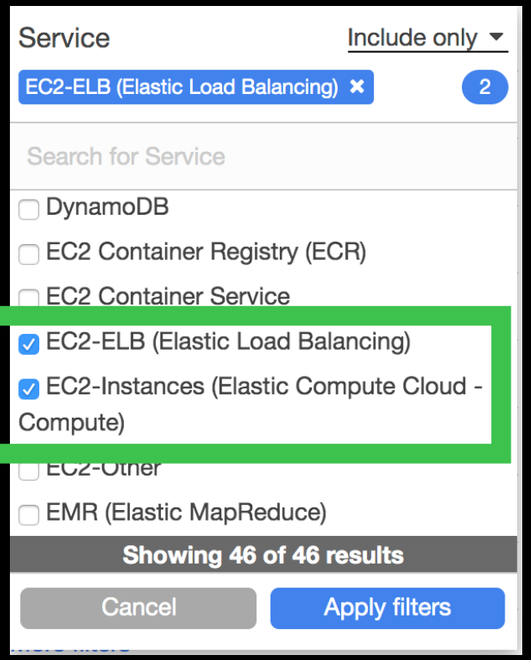


See detailed steps at https://aws.amazon.com/blogs/mt/using-aws-cost-explorer-to-analyze-data-transfer-costs/

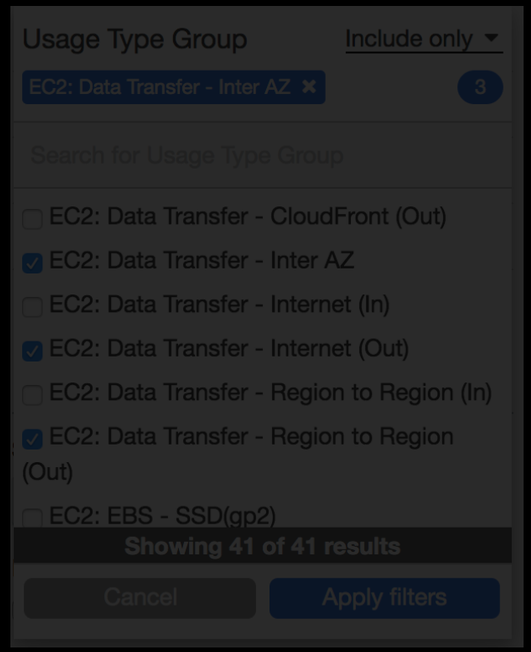
Visualize data transfer cost with Cost Explorer

Step 2: Select filters in Cost Explorer

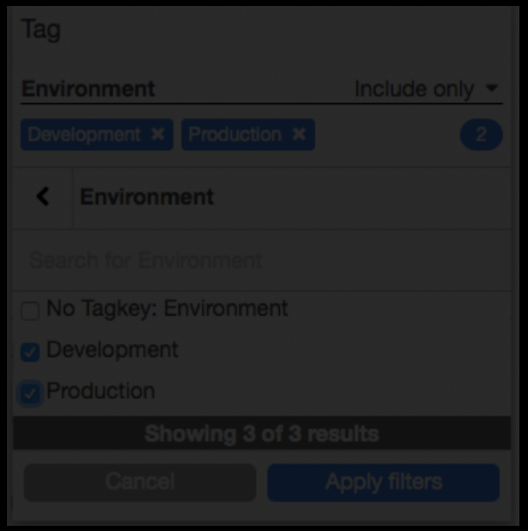
Service filters



Usage filters



Tag filters

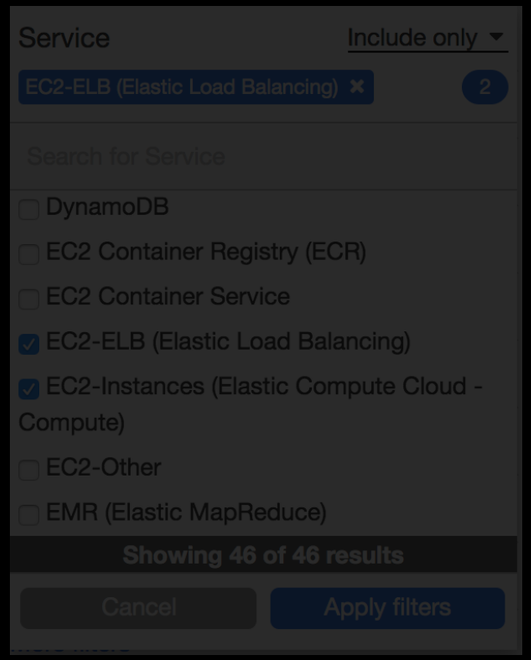


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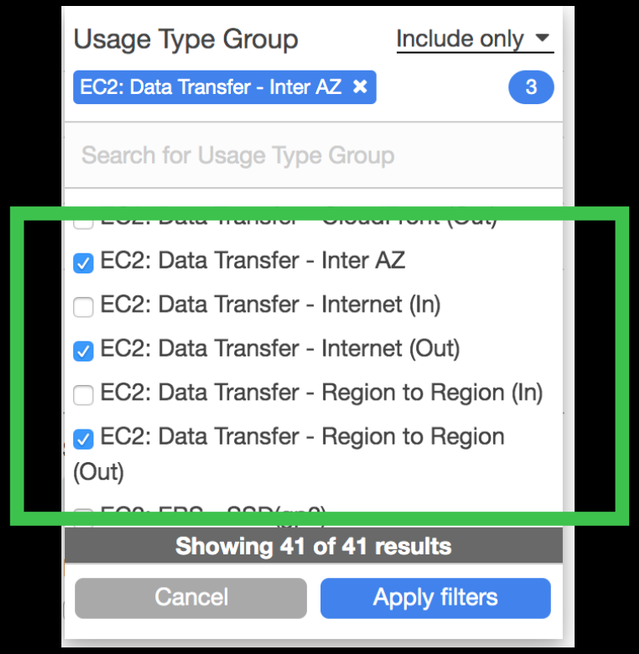
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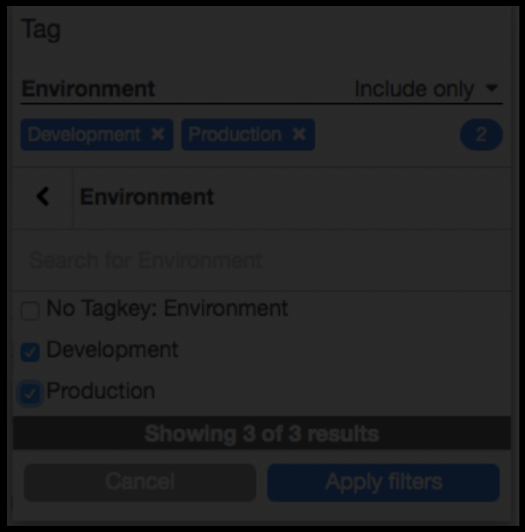
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Usage filters



Tag filters

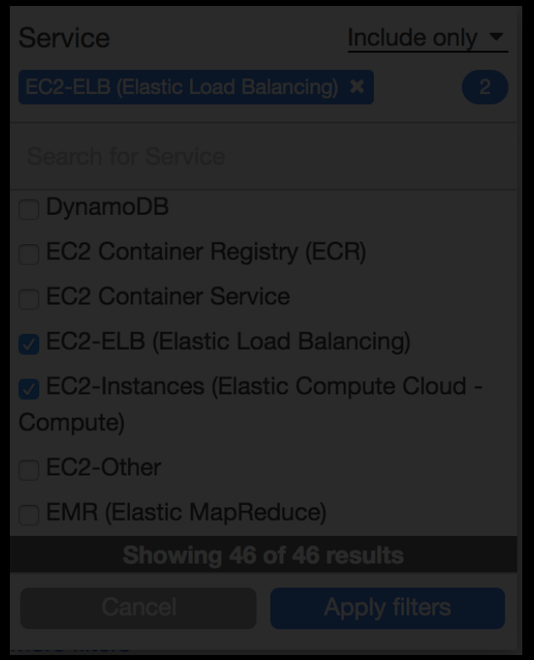


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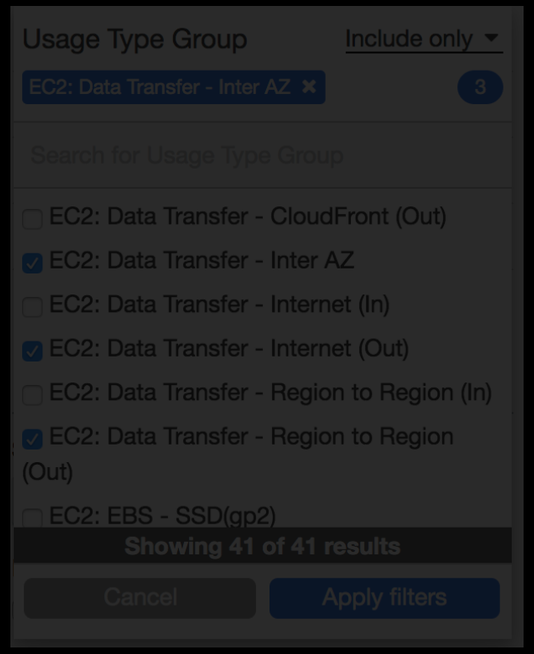
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Step 2: Select filters in Cost Explorer

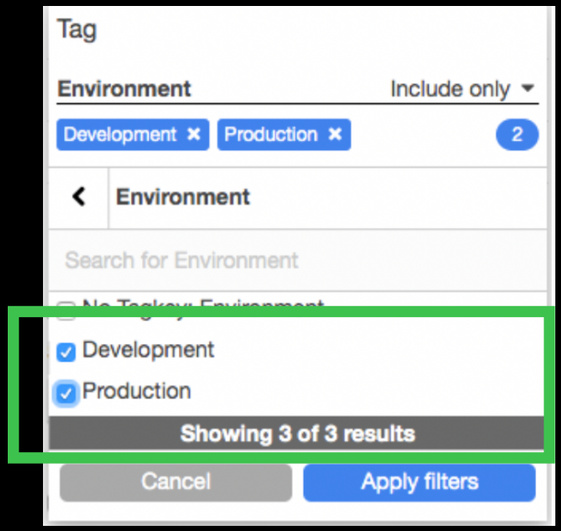
Service filters



Usage filters



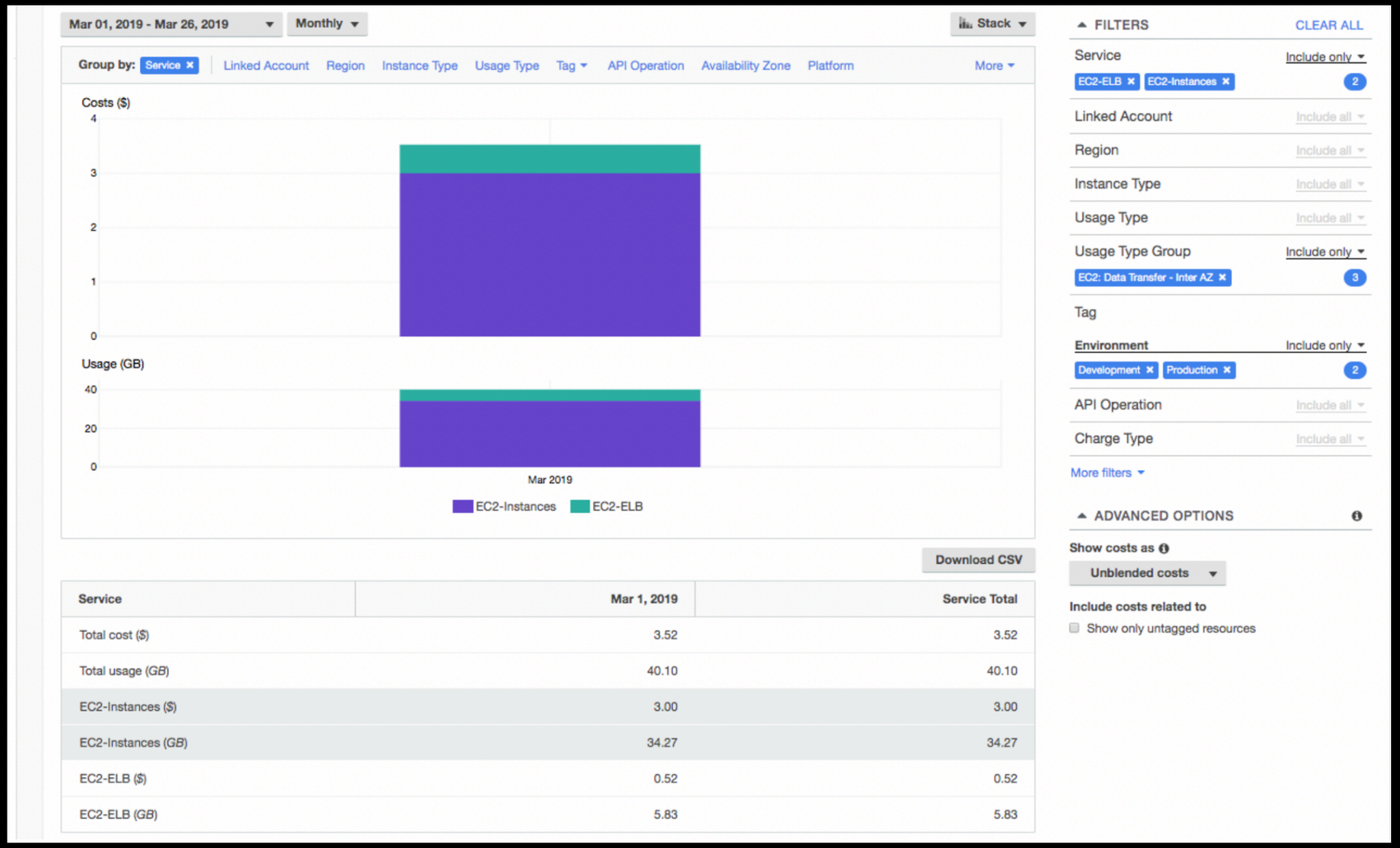
Tag filters



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Visualize data transfer cost with Cost Explorer

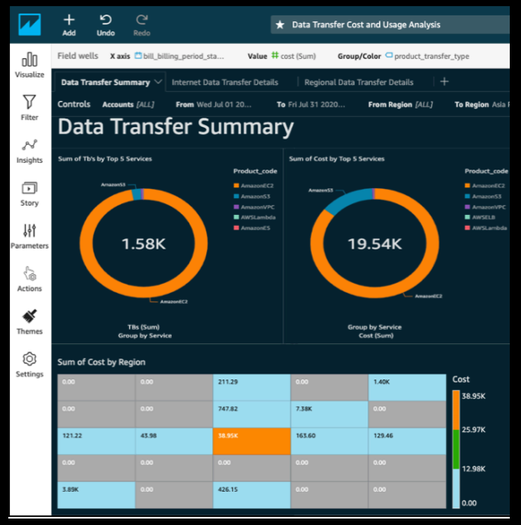
Step 3: See data transfer costs



Service	Mar 1, 2019	Service Total
Total cost ($)	3.52	3.52
Total usage (GB)	40.10	40.10
EC2-Instances ($)	3.00	3.00
EC2-Instances (GB)	34.27	34.27
EC2-ELB ($)	0.52	0.52
EC2-ELB (GB)	5.83	5.83

See detailed steps at https://aws.amazon.com/blogs/mt/using-aws-cost-explorer-to-analyze-data-transfer-costs/

More data transfer resources



Data Transfer QuickSight Dashboard*

Well-Architected Labs:
https://bit.ly/3laKa3B

Use flow logs to understand data transfer at a flow level

CLOUDZERO

APPTIO®
Cloudability

These AWS Partners, and more, offer solutions for managing data transfer

* Additional charges may apply

Tips for minimizing data transfer

Serve web content from Amazon CloudFront where possible

Build application partitions within one Availability Zone

Use Application Load Balancers within your Regions

Use **AWS Well-Architected** principles to help optimize your data transfer: https://amzn.to/2Il2J7h

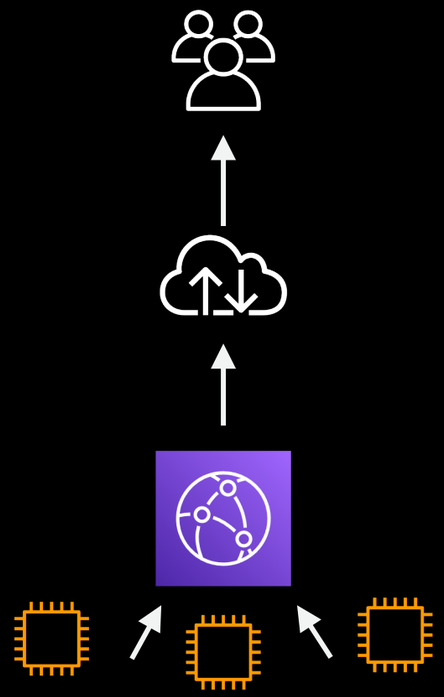


Tips for minimizing data transfer

Serve web content from Amazon CloudFront where possible

Build application partitions within one Availability Zone

Use Application Load Balancers within your Regions



CloudFront DT rates offer savings over traditional DTO

CloudFront doesn’t charge for origin fetch from AWS services

CDN at the edge adds better customer experience for a lower price

Tips for minimizing data transfer

Serve web content from Amazon CloudFront where possible

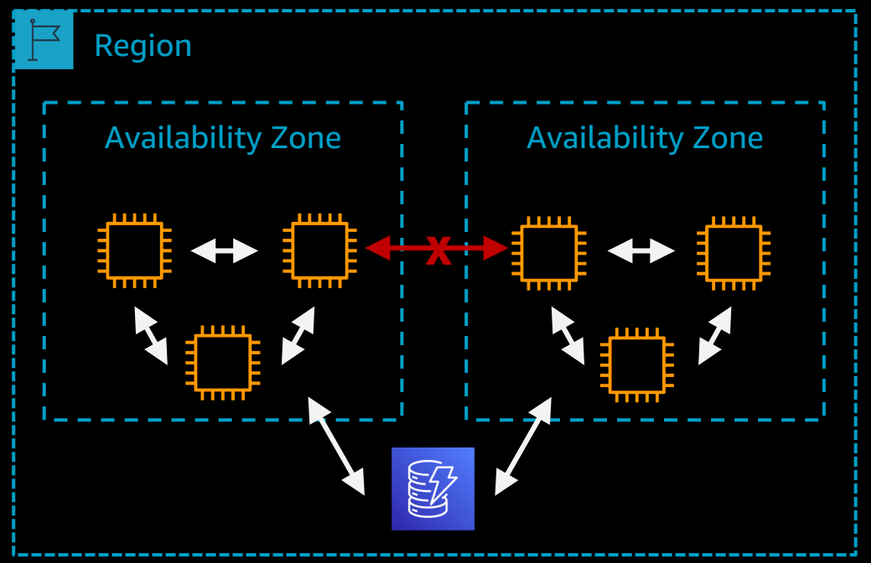
Build application partitions within one Availability Zone

Use Application Load Balancers within your Regions

Avoid unnecessary inter-AZ DT spend by limiting AZ-to-AZ app chatter

Create partitions of an application within a single AZ, and only replicate data between them as needed

Use AWS-managed data services (Amazon Aurora, DynamoDB, etc.) to persist data between AZs



Tips for minimizing data transfer

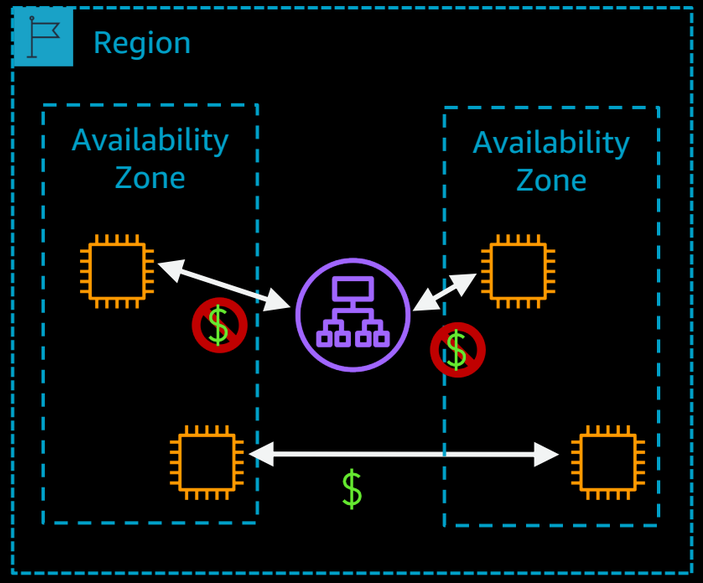
Serve web content from Amazon CloudFront where possible

Build application partitions within one Availability Zone

Use Application Load Balancers within your Regions

Data transferred between EC2 and an ALB (or a Classic Load Balancer) in a single Region is free; this only applies to resources using private IP addresses

When DT between AZs is necessary, ALB and CLB can help defray inter-AZ charges



For more information about data transfer pricing and variables that can affect it, see https://aws.amazon.com/ec2/pricing/on-demand/

Suggested resources

Service information and pricing:

Amazon EC2 On-demand and data transfer pricing: https://aws.amazon.com/ec2/pricing/on-demand/

Amazon CloudFront: https://aws.amazon.com/cloudfront/

AWS Transit Gateway: https://aws.amazon.com/transit-gateway/

AWS Direct Connect: https://aws.amazon.com/directconnect/

Elastic Load Balancing: https://aws.amazon.com/elasticloadbalancing/

Using AWS Cost Explorer to analyze data transfer costs blog:

https://aws.amazon.com/blogs/mt/using-aws-cost-explorer-to-analyze-data-transfer-costs/

AWS Well-Architected Labs Data Transfer Dashboard:

https://bit.ly/3laKa3B

AWS Well-Architected:

https://amzn.to/2Il2J7h

Thank you!

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