AWS re:Invent

NOV. 29 – DEC. 3, 2021 | LAS VEGAS, NV

WIN306-R2

Architect reliable applications on AWS

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Tasks when designing workload architecture

1. Maximize our workload reliablity
2. Reduce our blast radius
3. Understand how the vendor's SLA affects our architecture decisions
4. Apply our reliablity strategy with cost in mind

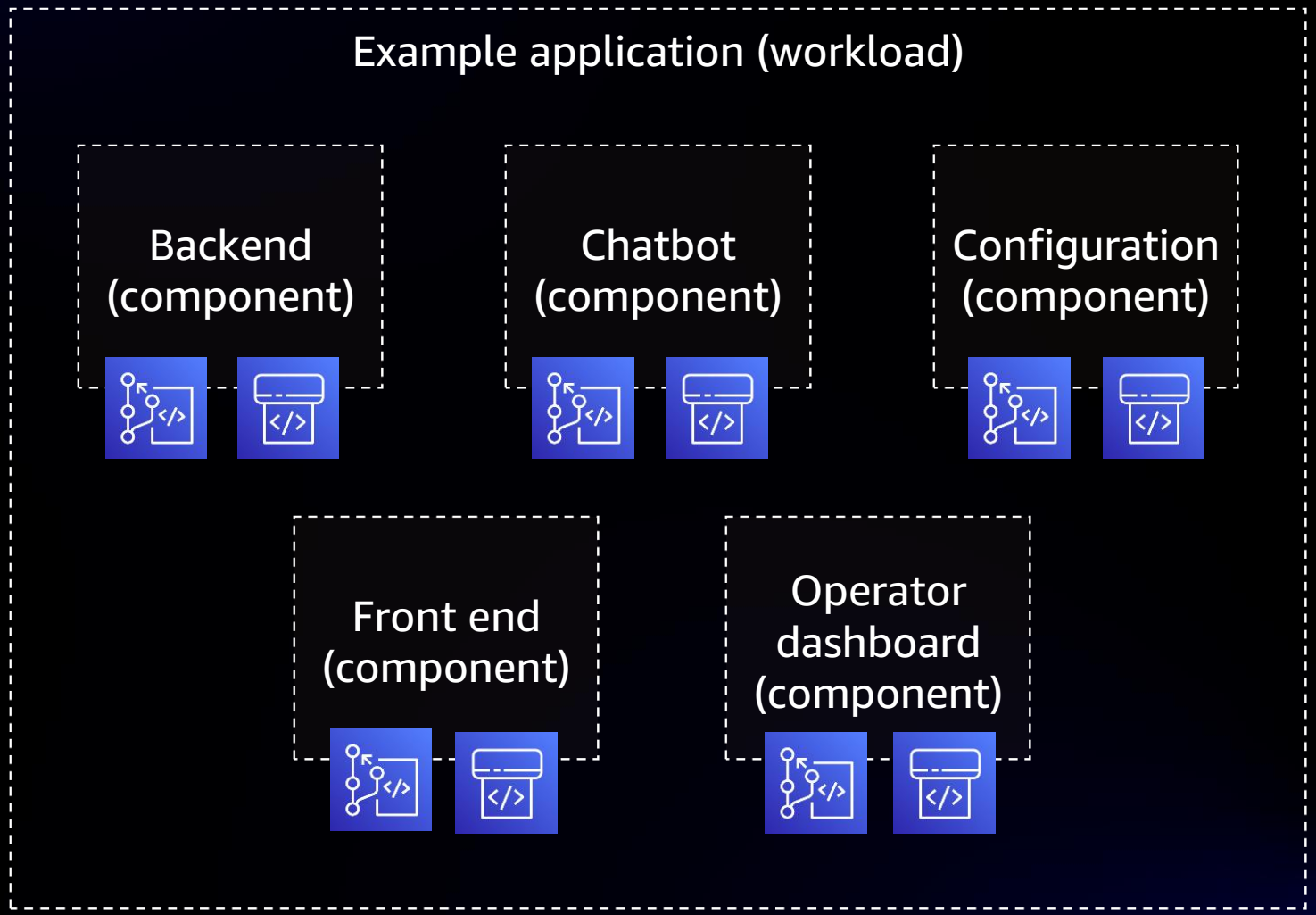
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“Everything fails all the time”

Werner Vogels
Amazon CTO

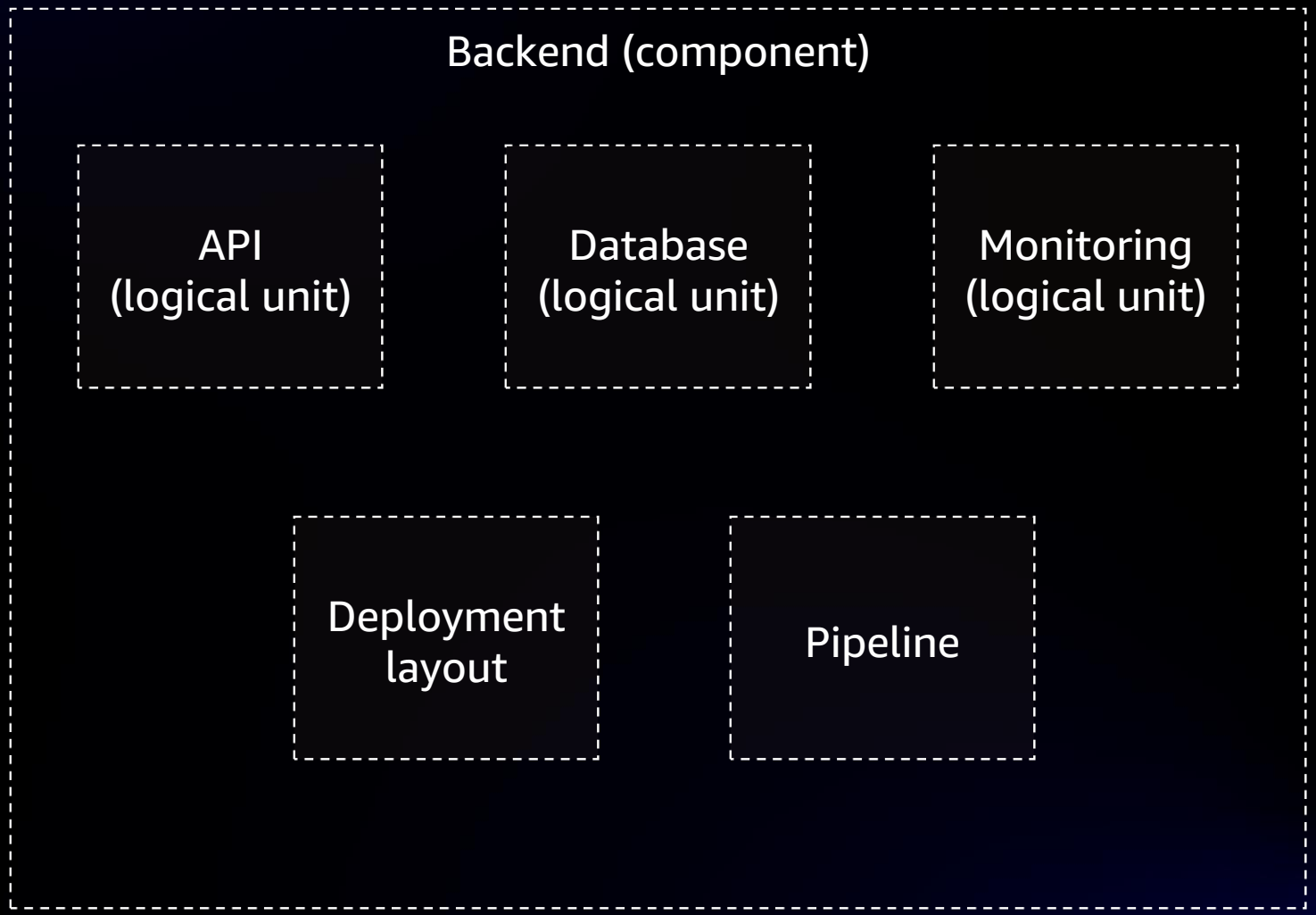
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Workload and components



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Workload and components



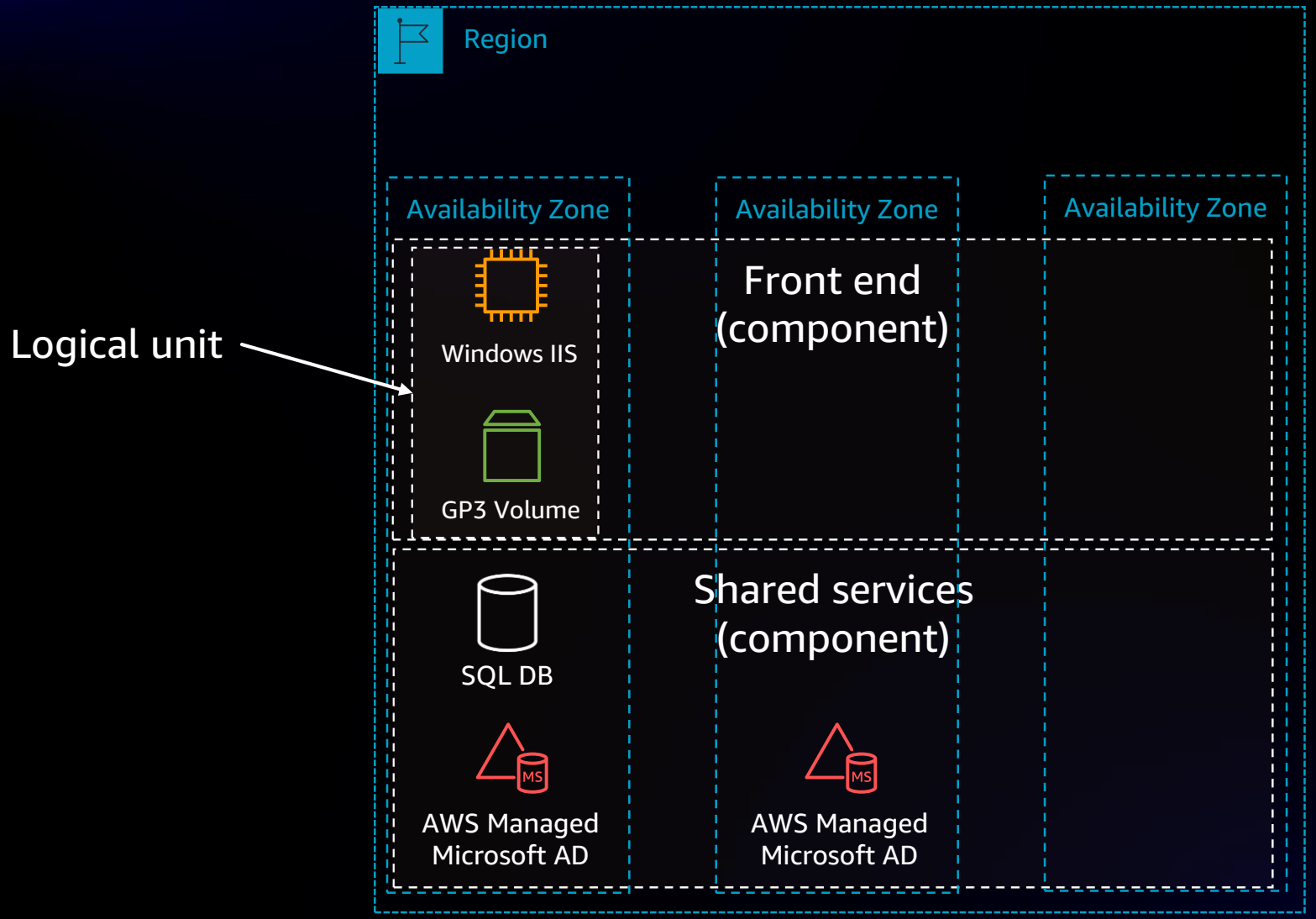
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Music store (workload)



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Music store (workload)

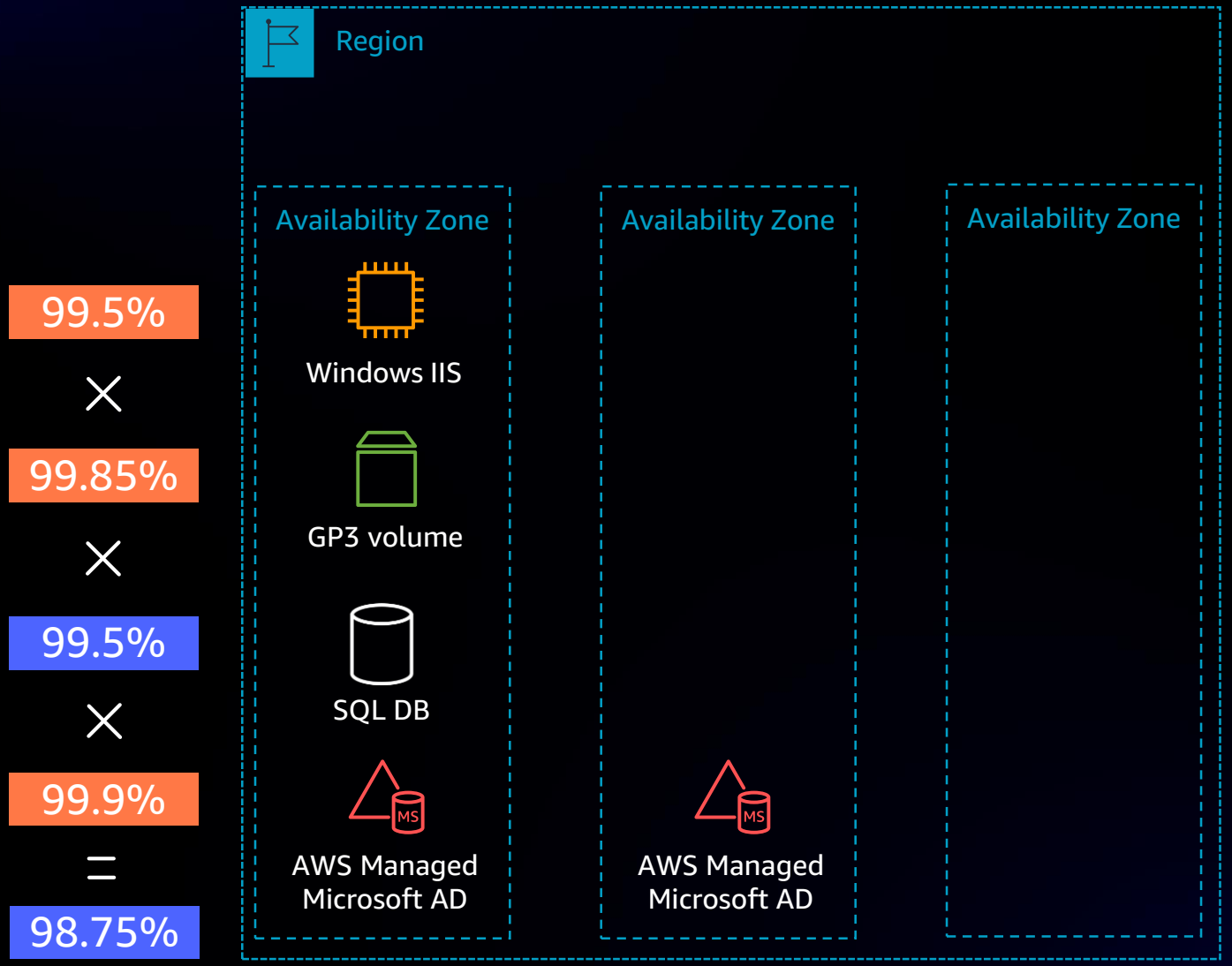


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Workload architecture: Single AZ

Amazon SLA

Calculated uptime



Uptime (RTO) = 98.75%

Blast radius = 100%

Uptime (RTO) = 98.75%

- *9 hours 7 minutes monthly*
- *4 days 13 hours and 34 minutes yearly*

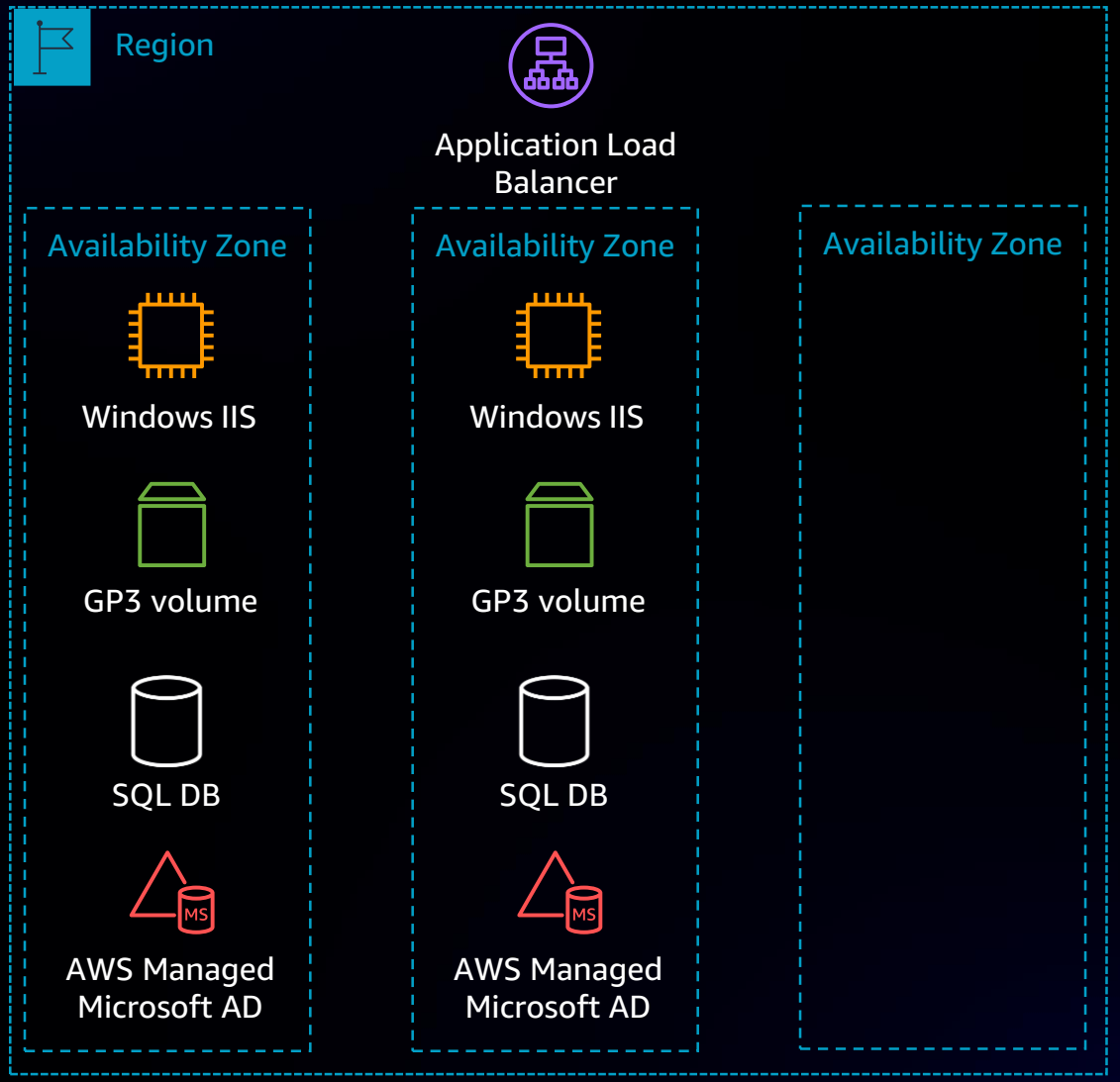
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Workload architecture: Multi AZ

Amazon SLA

Calculated uptime

99.99% × 99.99% × 99.85% × 99.95% × 99.9% = 99.6%



Uptime (RTO) = 99.6%

Blast radius = 50%

Uptime (RTO) = 99.6%

- *2 hours 55 minutes monthly*
- *1 day 11 hours and 3 minutes yearly*

aws

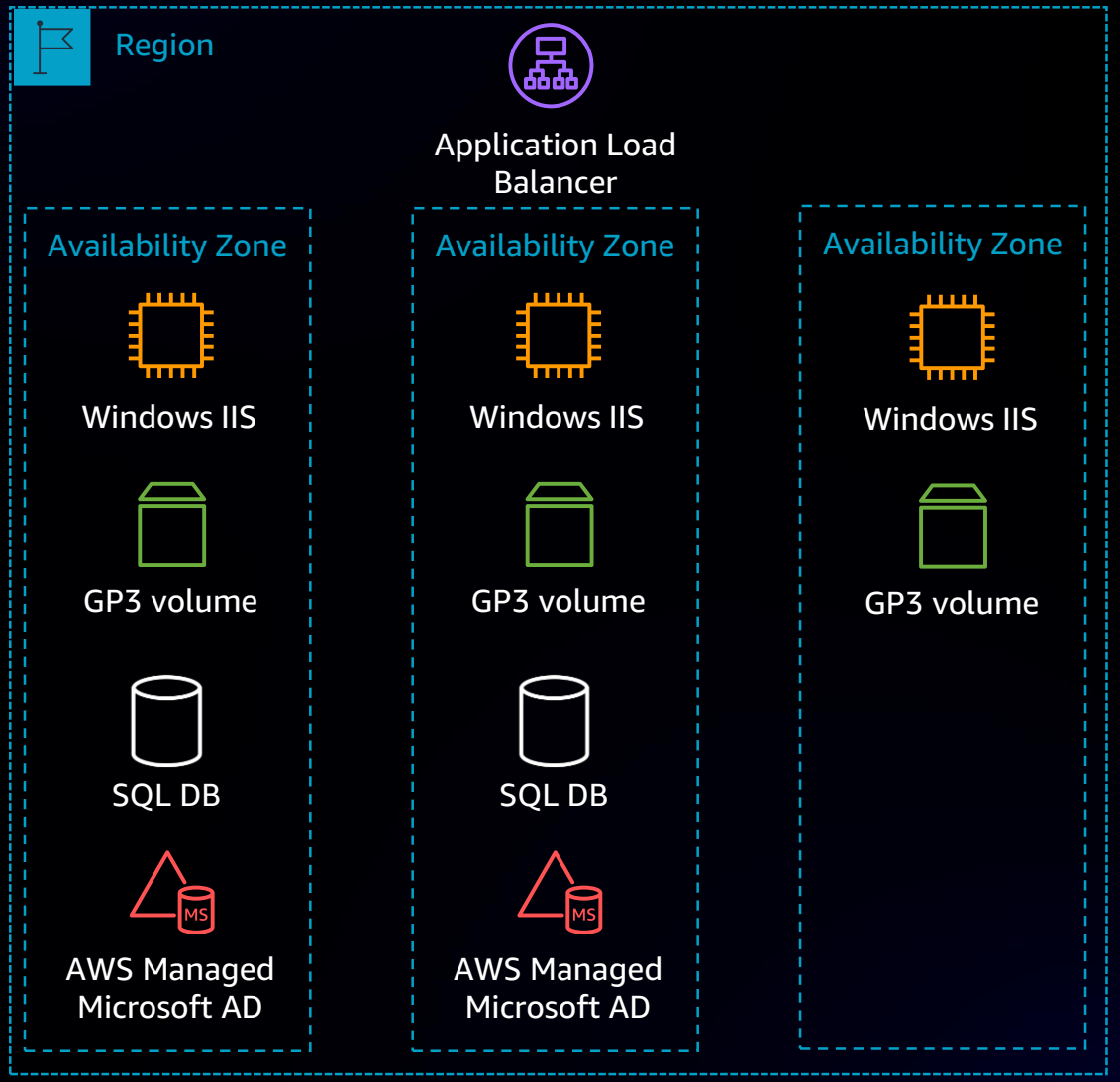
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Workload architecture: Multi AZ (3)

Amazon SLA

Calculated uptime

99.99% × 99.99% × 99.85% × 99.95% × 99.9% = 99.6%



Uptime (RTO) = 99.6%

Blast radius = 33%

Uptime (RTO) = 99.6%

- *2 hours 55 minutes monthly*
- *1 day 111 hours and 3 minutes yearly*

aws

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Workload architecture: Multi AZ (3)

Amazon SLA

Calculated uptime

99.99%

×

99.99%

×

99.999%

×

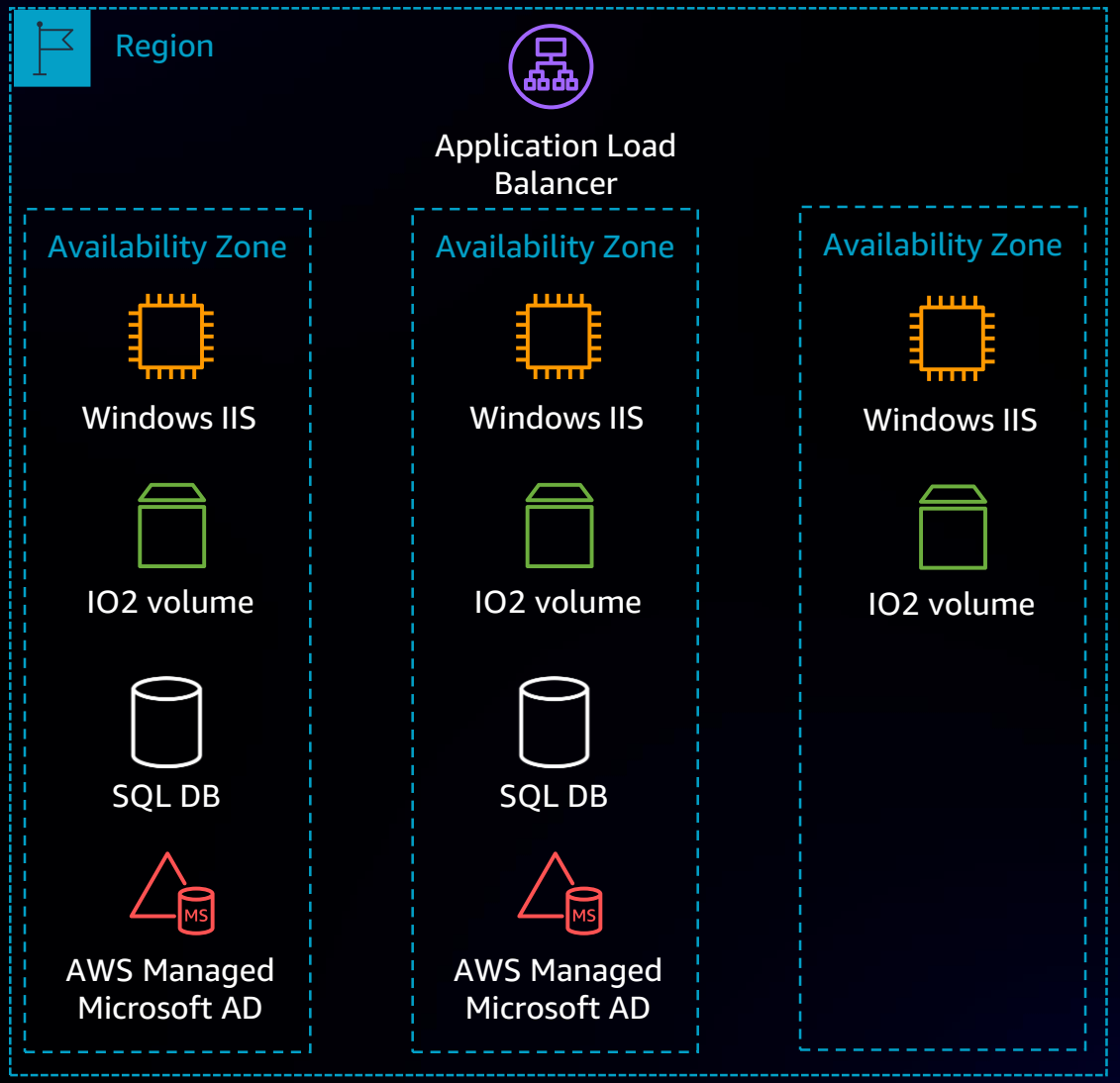
99.95%

×

99.9%

=

99.8%



Uptime (RTO) = 99.8%

Blast radius = 33%

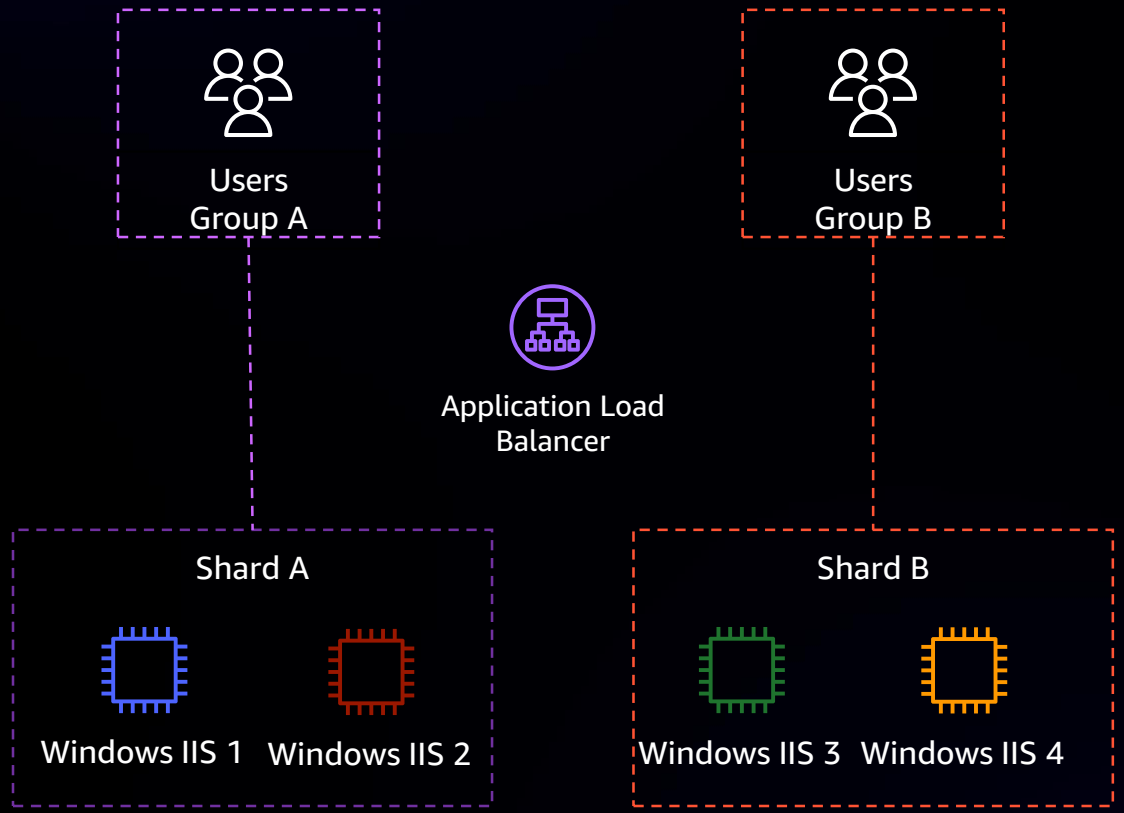
Uptime (RTO) = 99.8%

- *1 hour 27 minutes monthly*
- *17 hours 31 minutes yearly*

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Reducing blast radius: Regular sharding

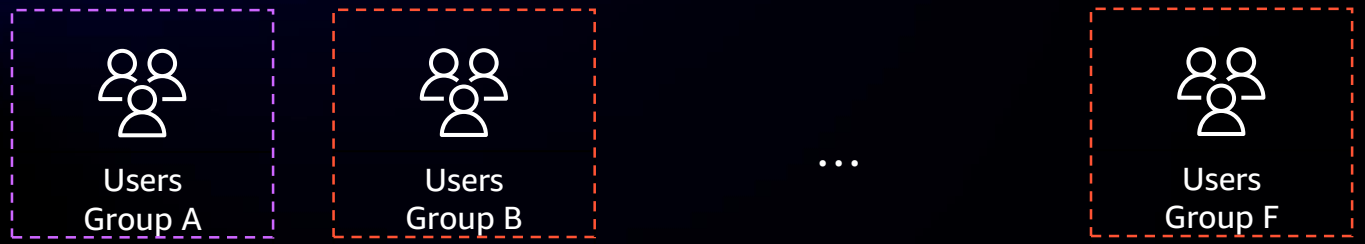


Number of hosts: 4
Number of shards: 2

Blast radius = 25-50%

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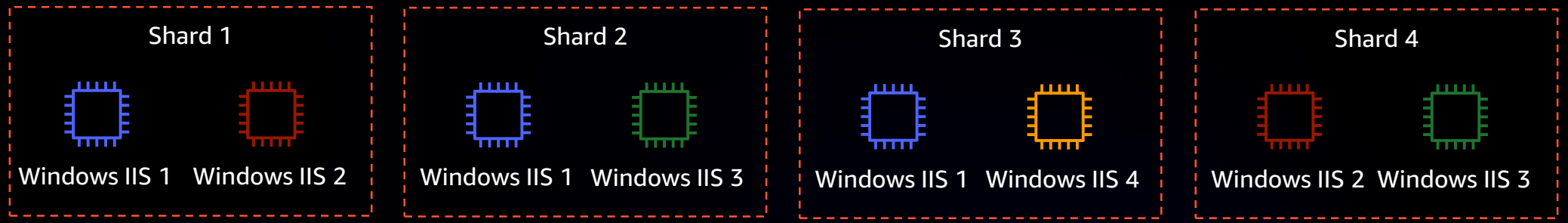
Shuffle sharding

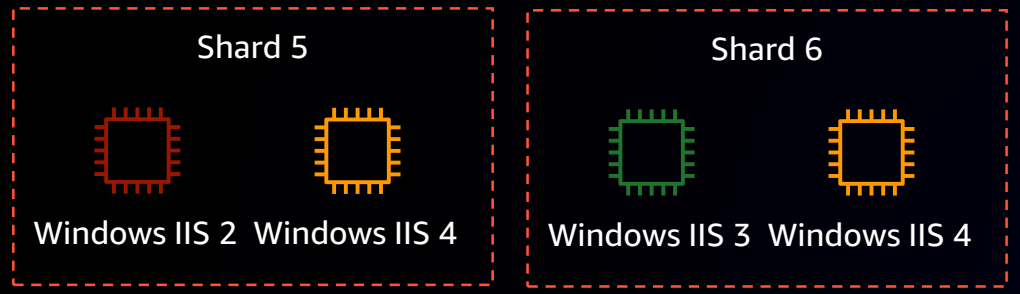


Number of hosts: 4
Number of shards: 6

Blast radius = ~16%

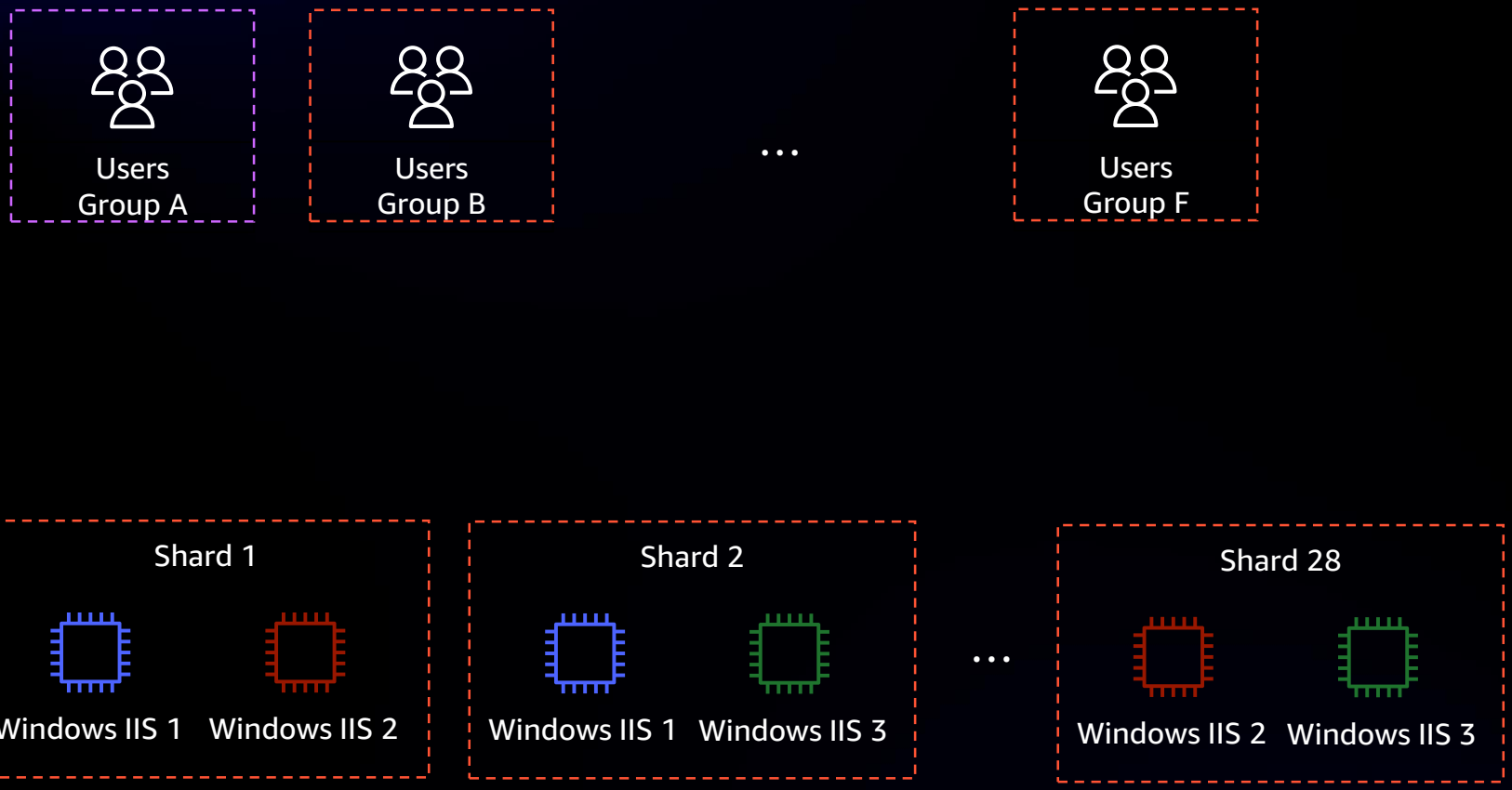
How many combinations of two instances can we have in a group of four instances?





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Shuffle sharding



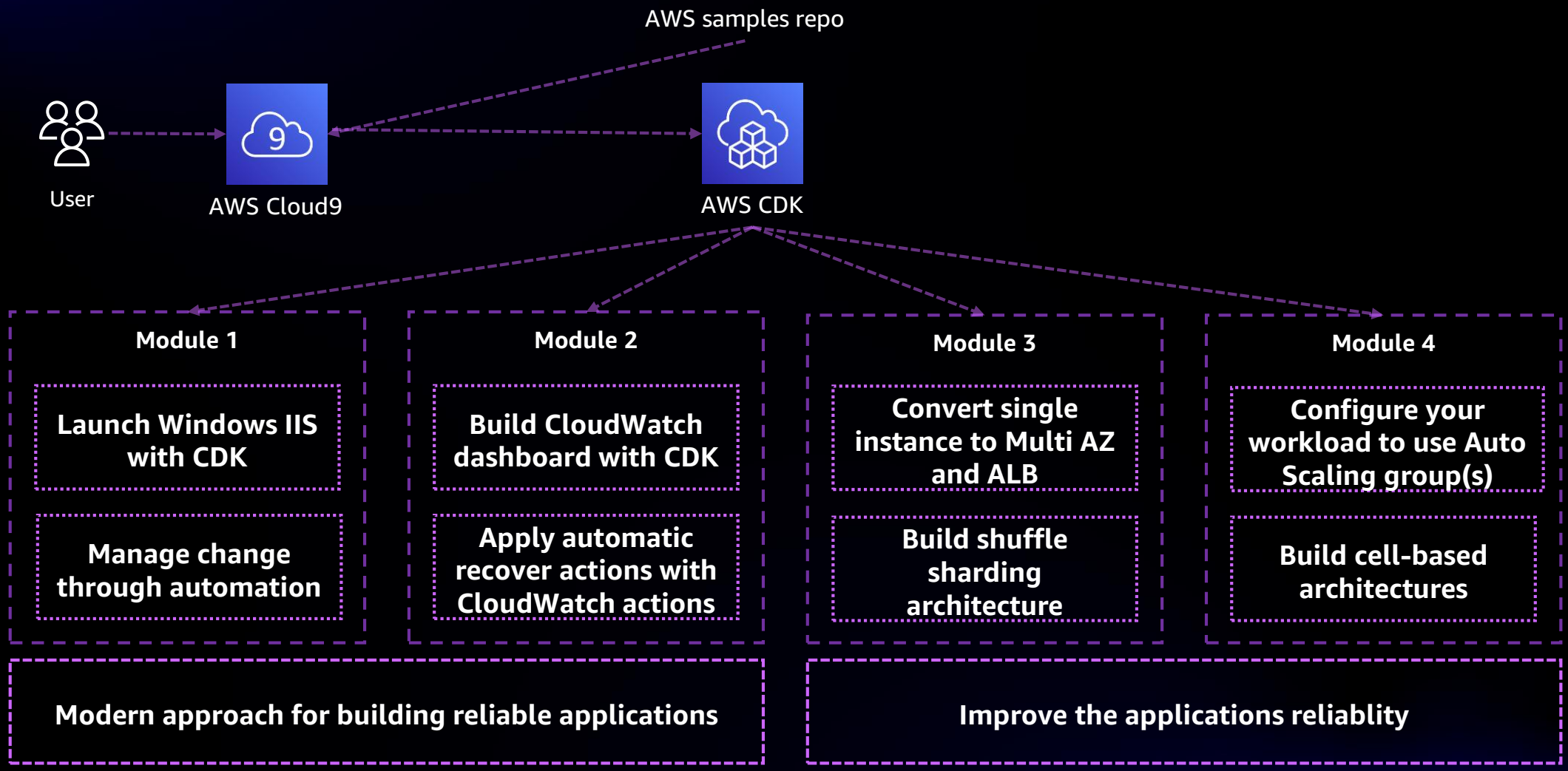
Number of hosts: 8
Number of shards: 28

Blast radius = ~3%

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The workshop

Starting point: Very simple IIS site configured with PowerShell script injected into the user data



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Links

Workshop site: https://s12d.com/win306

Event Dashboard: https://s12d.com/win306-dashboard

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Thank you!

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