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wcollins.io



Community Day

MIDWEST | COLUMBUS, OH

# Cruising through *Network Complexity*

while migrating apps  
to AWS at Warp Speed



# Agenda

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1.

The Plot

2.

Sprint, Walk, Crawl

3.

Network Complexity

4.

Cruise Control



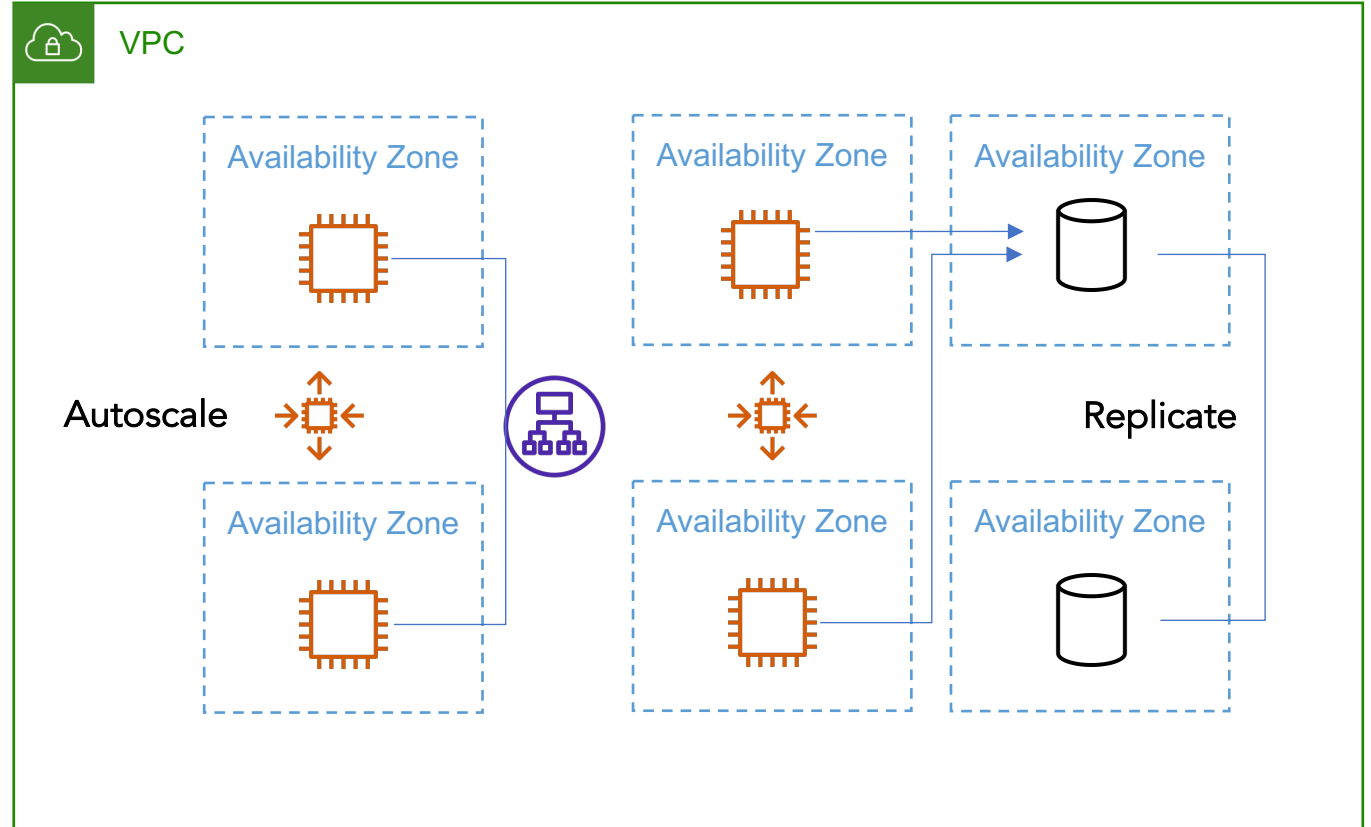
[github.com/wcollins/cruising-through-network-complexity](https://github.com/wcollins/cruising-through-network-complexity)



# The Plot

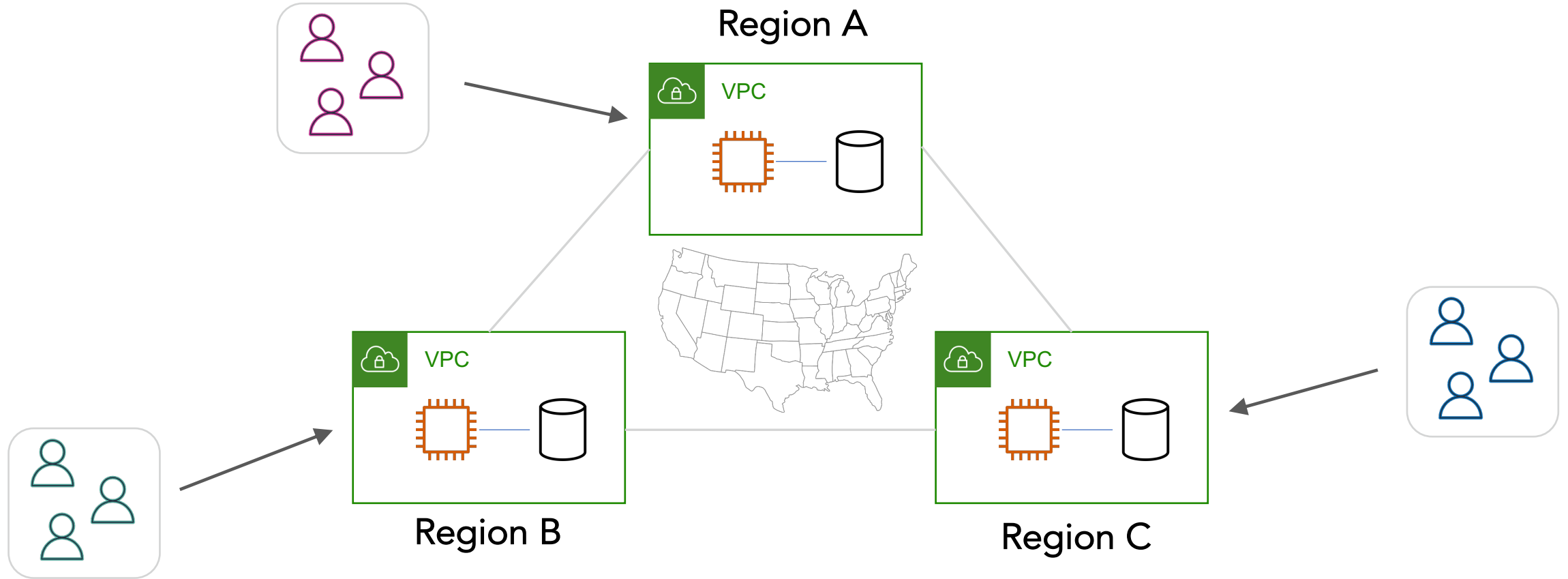


Developer  
Experience





# The Plot



Customer  
Experience

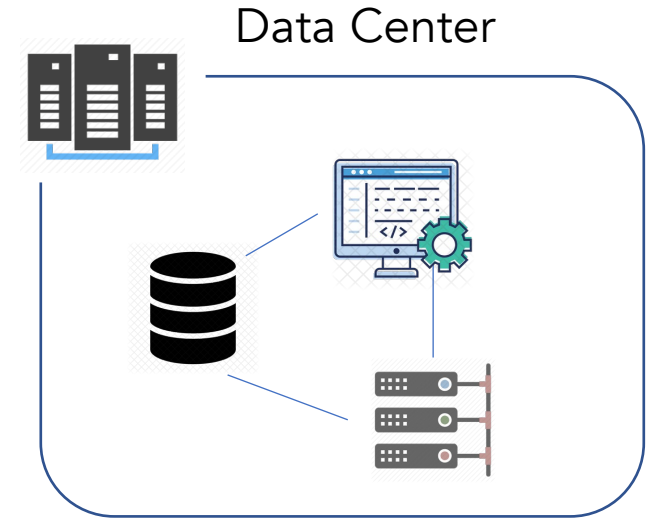


# The Plot

 Enterprise  
(15K or more employees)

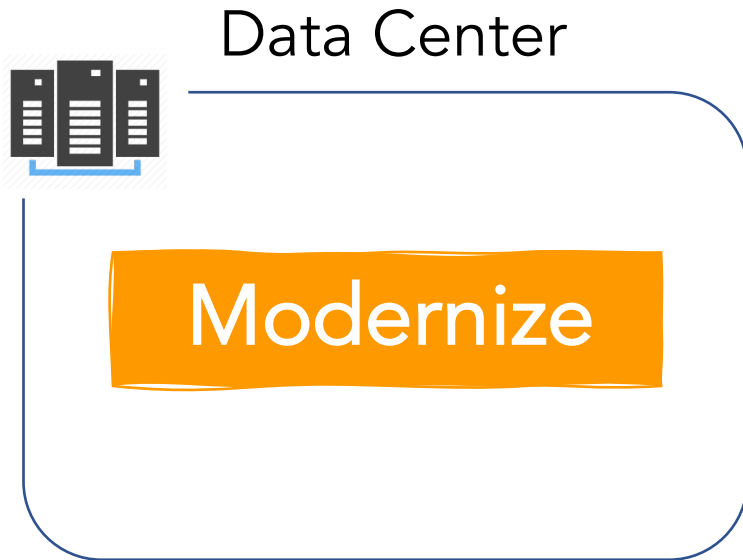


100 – 2,000  
Applications



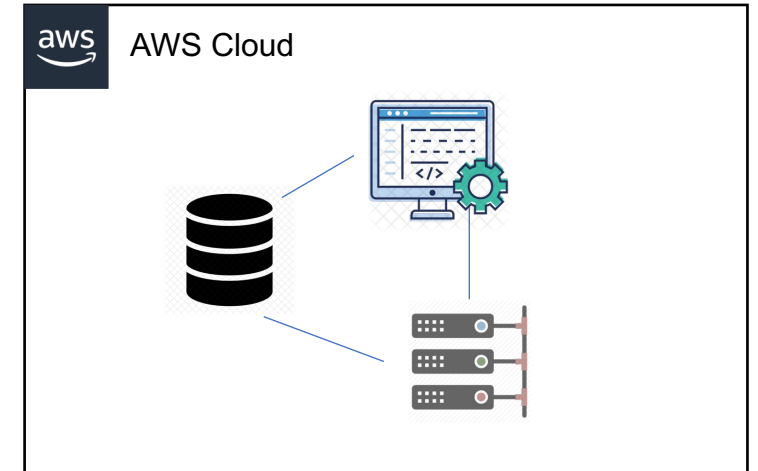


# The Plot



Digital

Transformation





# Sprint, Walk, Crawl

Learning to  
play music

Let's learn  
Beethoven in  
our first week!

Sprint

I don't have  
the skills yet

Walk

I need to learn  
to read music

Crawl

Perspective

Digital  
Transformation

Sprint

Let's migrate all  
our applications  
this year!

Walk

There is a lot  
we didn't fully  
understand

Crawl

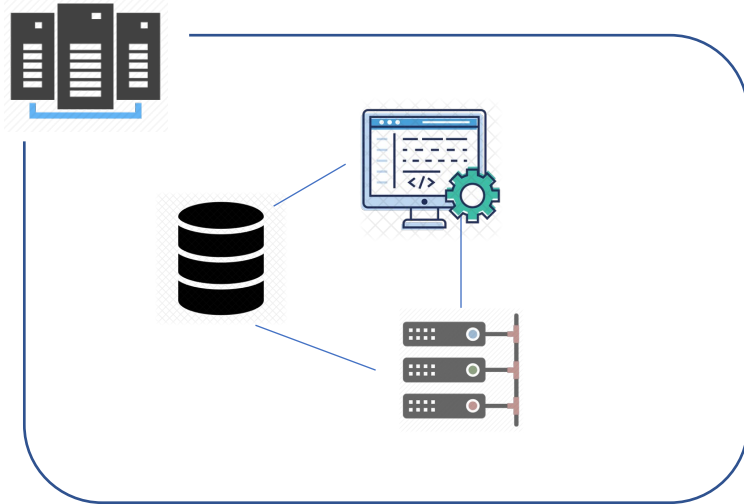
Let's get the  
basics down



# Sprint, Walk, Crawl

## What does the network need to support?

### 1.) Brownfield (*Migrations*)

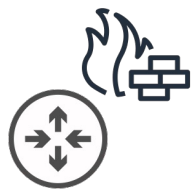


Fast + Reliable Connection

### 2.) Greenfield (*Cloud Native*)







# Network Complexity

## Complex

"characterized by a very complicated or involved arrangement of parts, units, etc"

[dictionary.com](https://www.dictionary.com)



[NetDevOps - Survey](#)

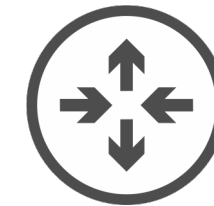
NetEng



\* Human



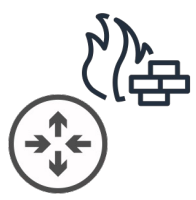
Up to 6 solutions are being used for generating and/or deploying configuration



5-24 different vendor devices/platforms



Multiple connection types are used to interact with devices  
(CLI/SSH, HTTPS, Restconf, Telnet, SNMP)



# Network Complexity

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Underlay

Internet

MPLS

P2P

Physical network gear and  
reliable optical infrastructure



# Network Complexity

Virtual networking built on top of  
underlying network infrastructure

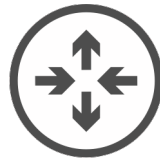


Overlay

Internet

MPLS

P2P



Underlay



# Cruise Control

## Investment = Reliability and Performance

<https://datacenterfrontier.com> › aws-has-spent-35-billio... ⋮

### AWS Has Spent \$35 Billion on its Northern Virginia Data ...

Oct 4, 2021 — Amazon's \$35 billion **investment** supports the **AWS** US-East Northern **Virginia** cloud region, which includes more than 50 data centers. It's the ...

<https://www.theregister.com> › aws\_oregon\_datacenter ⋮

### Amazon to spend \$12b on five more datacenters in Oregon

May 6, 2022 — Amazon **plans** to build **five** more **datacenters** in rural Oregon at estimated cost of \$11.8 **billion**, according to documents filed in Morrow ...

<https://siliconangle.com> › 2022/03/17 › aws-invest-2-3... ⋮

### AWS to invest \$2.3B+ in UK data centers over the next two years

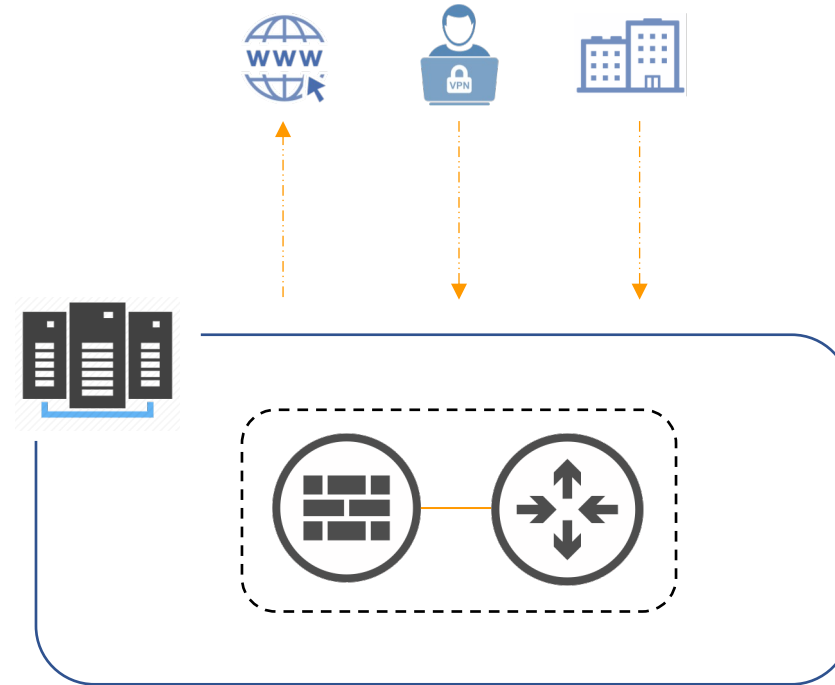
Mar 17, 2022 — **AWS** to **invest** \$2.3B+ in UK **data centers** over the next two years ... Amazon Web Services Inc. on Wednesday announced that it will spend more than £ ...



# Cruise Control



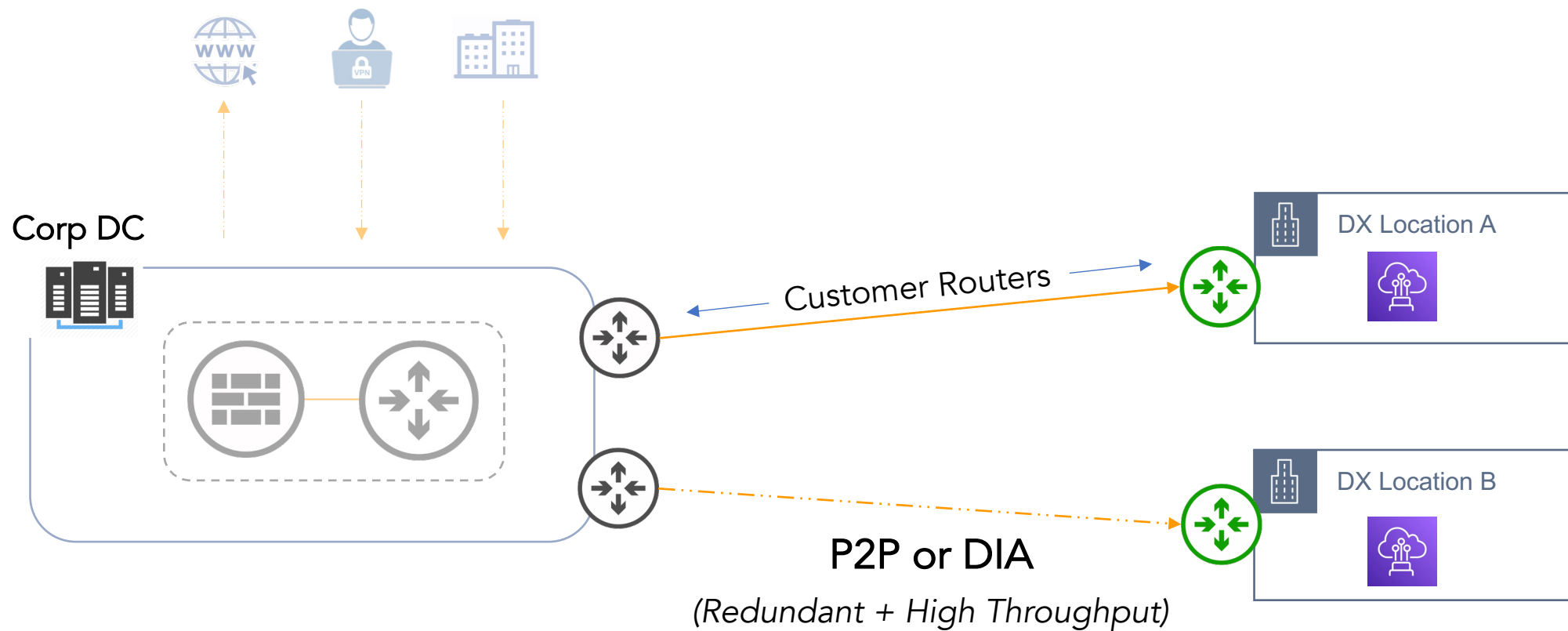
Let's not disrupt  
existing infrastructure



Corp Data Center

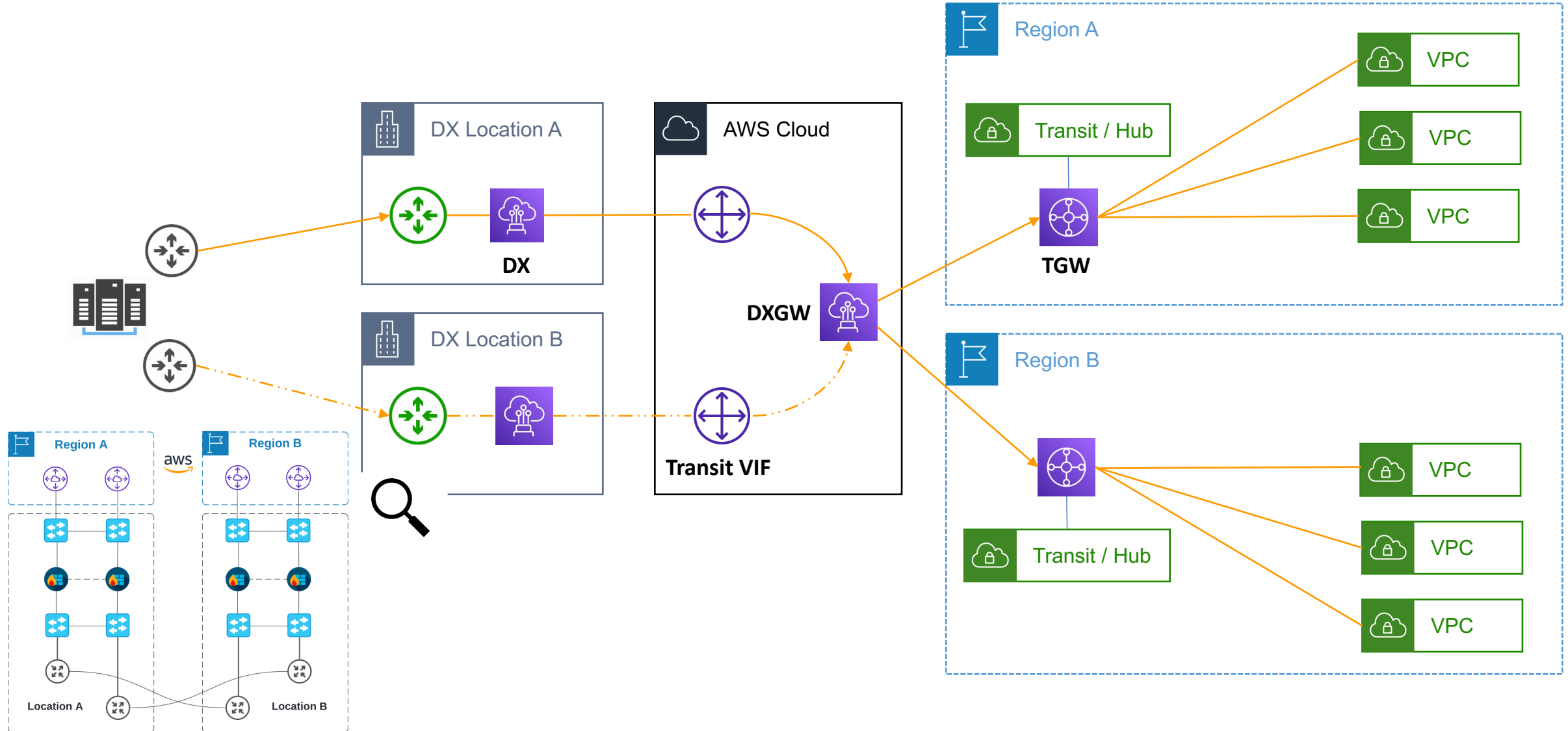


# Cruise Control



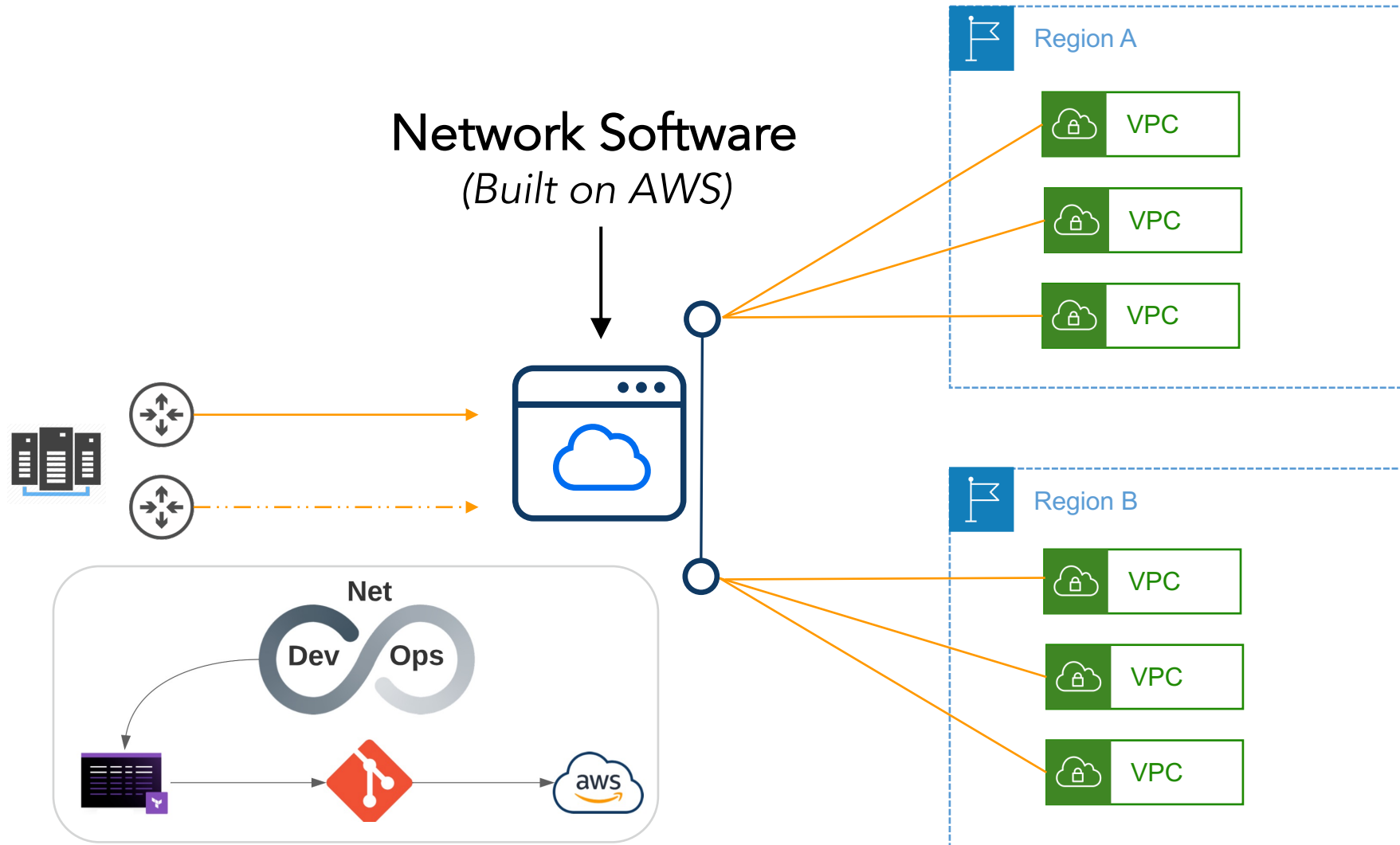


# Cruise Control





# Cruise Control



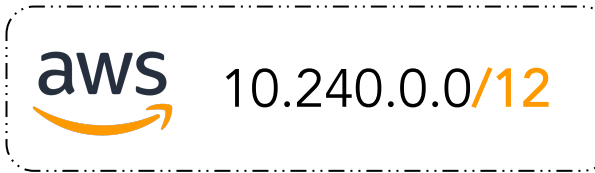




# Cruise Control



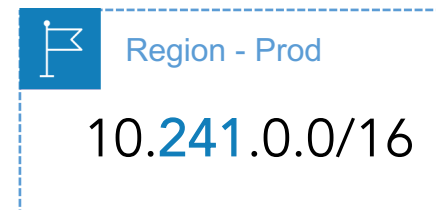
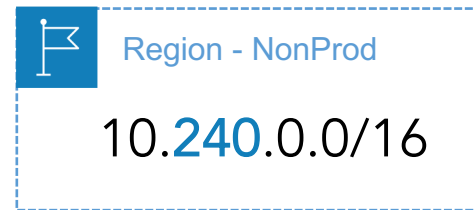
IP addressing still matters!



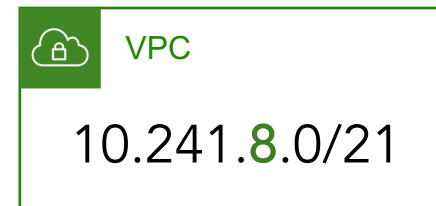
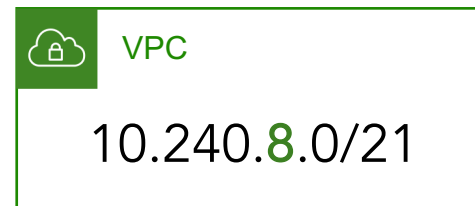
```
> ipcalc 10.240.0.0/12
Address: 10.240.0.0
Netmask: 255.240.0.0 = 12
Wildcard: 0.15.255.255
=>
Network: 10.240.0.0/12
HostMin: 10.240.0.1
HostMax: 10.255.255.254
Broadcast: 10.255.255.255
Hosts/Net: 1048574
```

```
00001010.1111 0000.00000000.00000000
11111111.1111 0000.00000000.00000000
00000000.0000 1111.11111111.11111111
=>
00001010.1111 0000.00000000.00000000
00001010.1111 0000.00000000.00000001
00001010.1111 1111.11111111.11111110
00001010.1111 1111.11111111.11111111
Class A, Private Internet
```

Even numbered  
/16 allocated to all  
non-production



Odd numbered  
/16 allocated to  
all production



3<sup>rd</sup> octet matches between  
NonProd and Prod VPCs.

Thank You!