AWS re:Invent

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

NFX401

How Netflix is using IPv6

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Cloud Network SRE
Netflix

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Step 1: Enable IPv6
Step 2: Use IPv6

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BYOIPv6 vs AWS IPv6 Usage

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- Provided by your company
- Ability to summarize regionally and globally
- Lead time to provision to each AWS account/Region

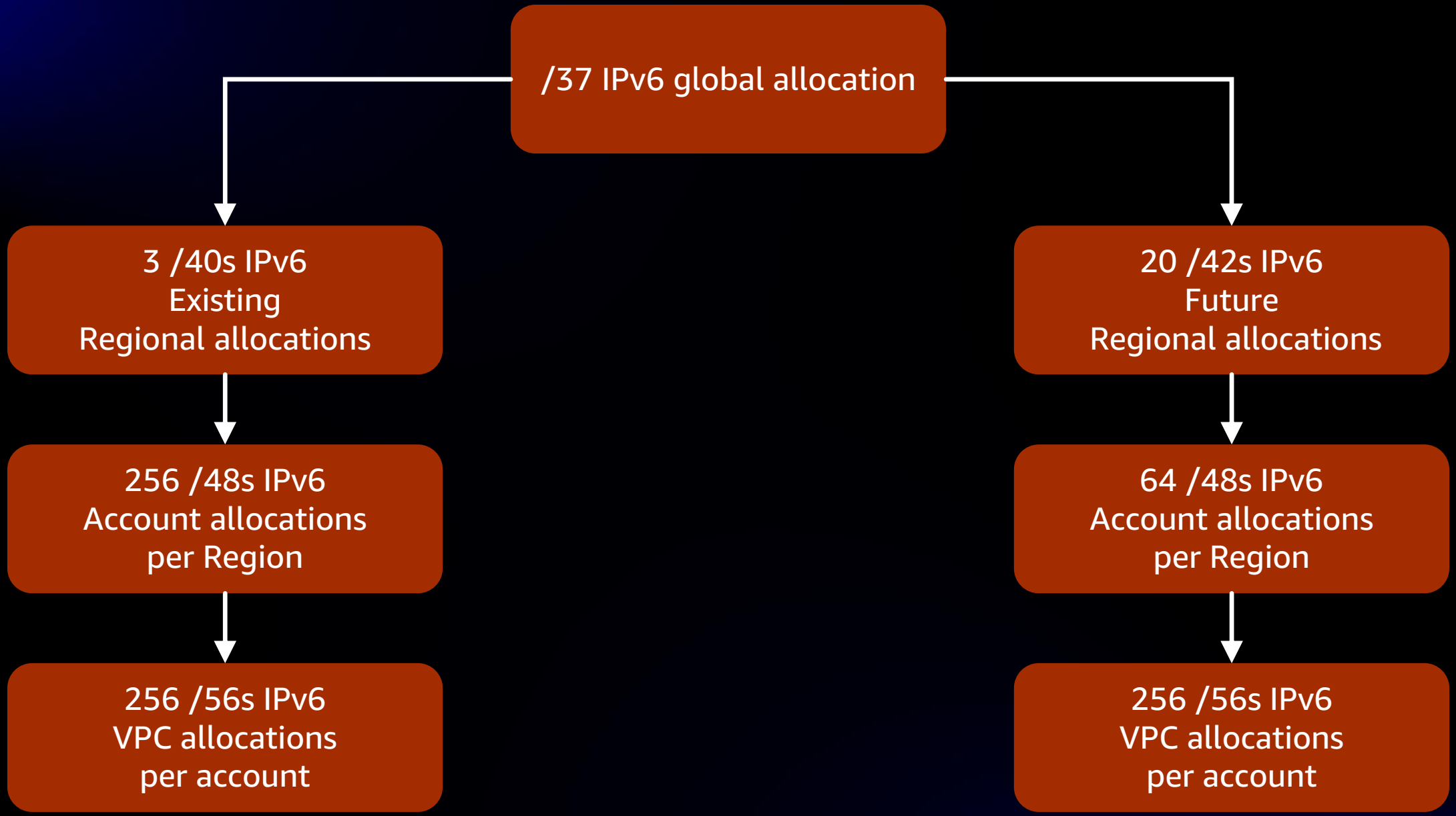
- Provided By AWS
- No ability to summarize across VPCs/Regions
- Can be provisioned instantly

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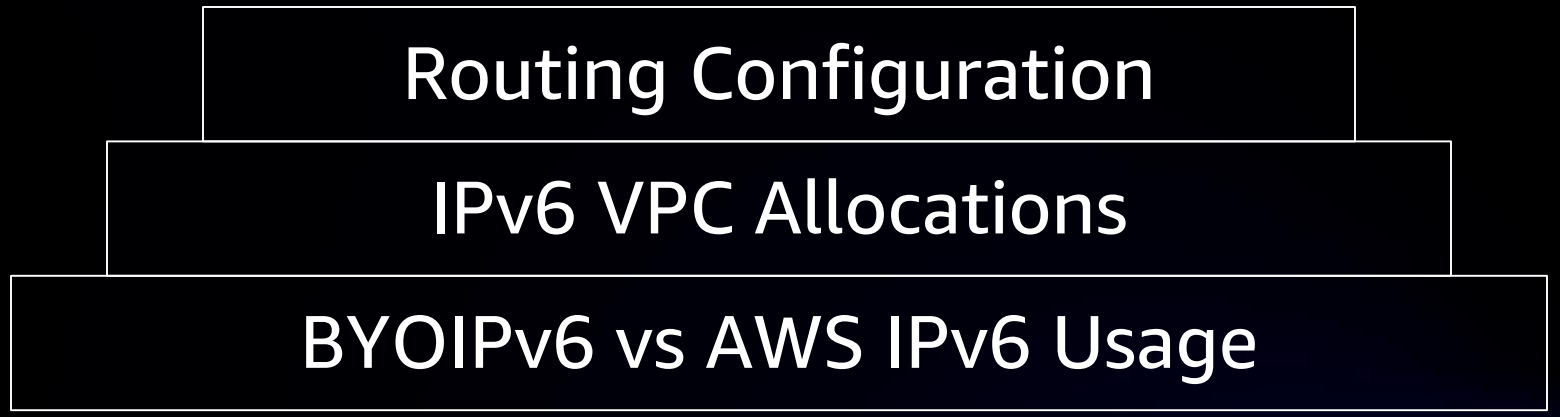
IPv6 VPC Allocations

BYOIPv6 vs AWS IPv6 Usage

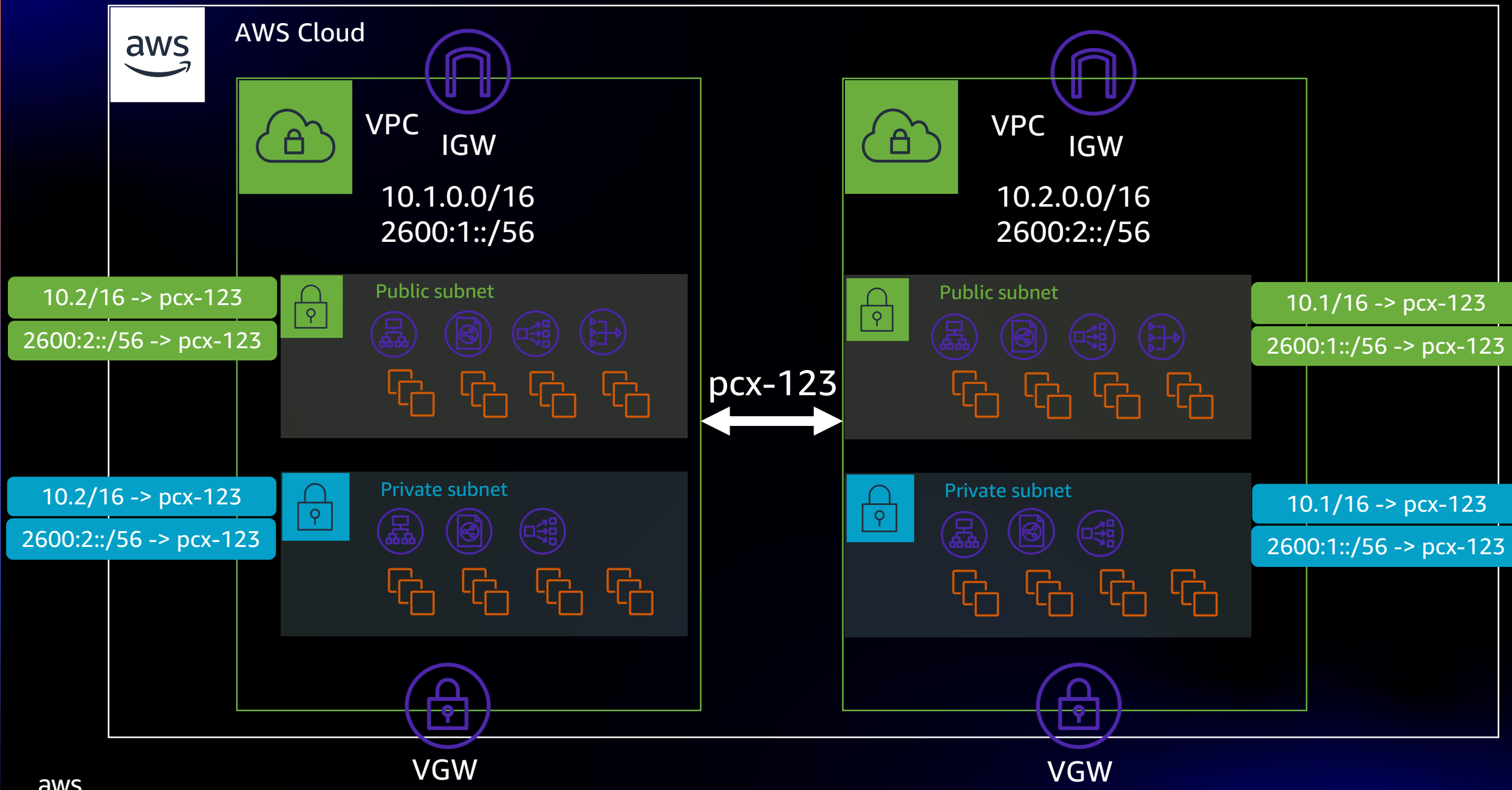
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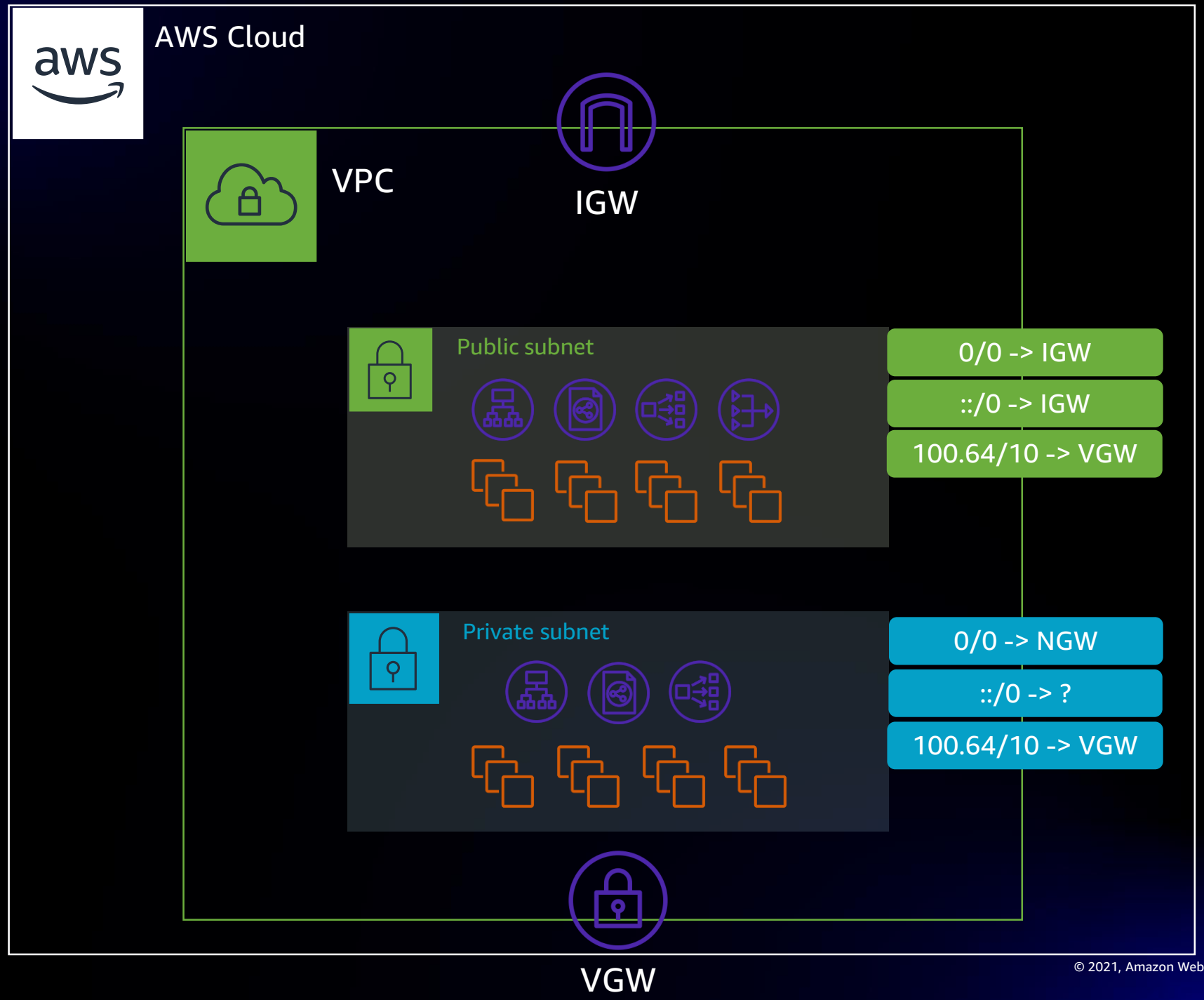
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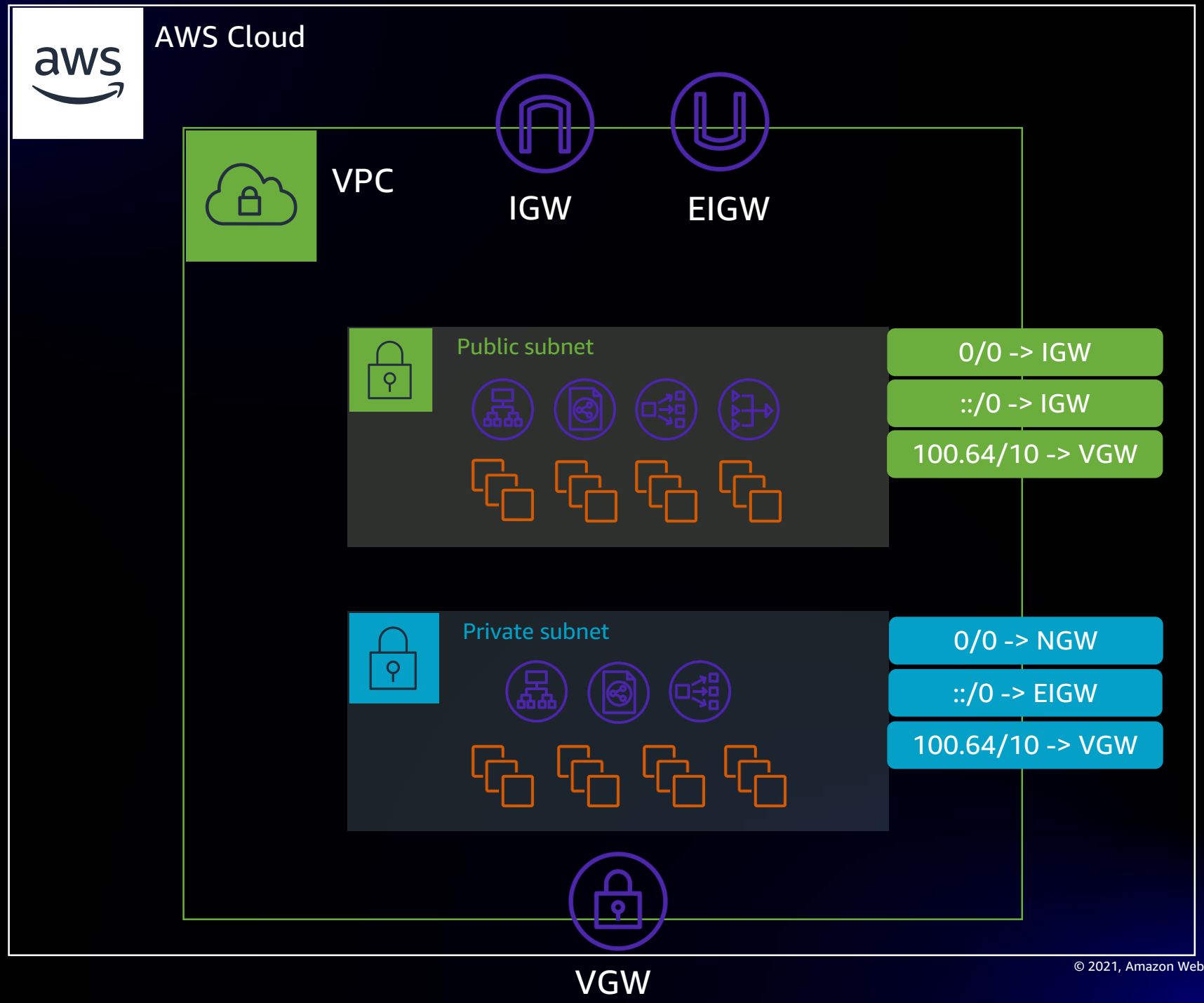
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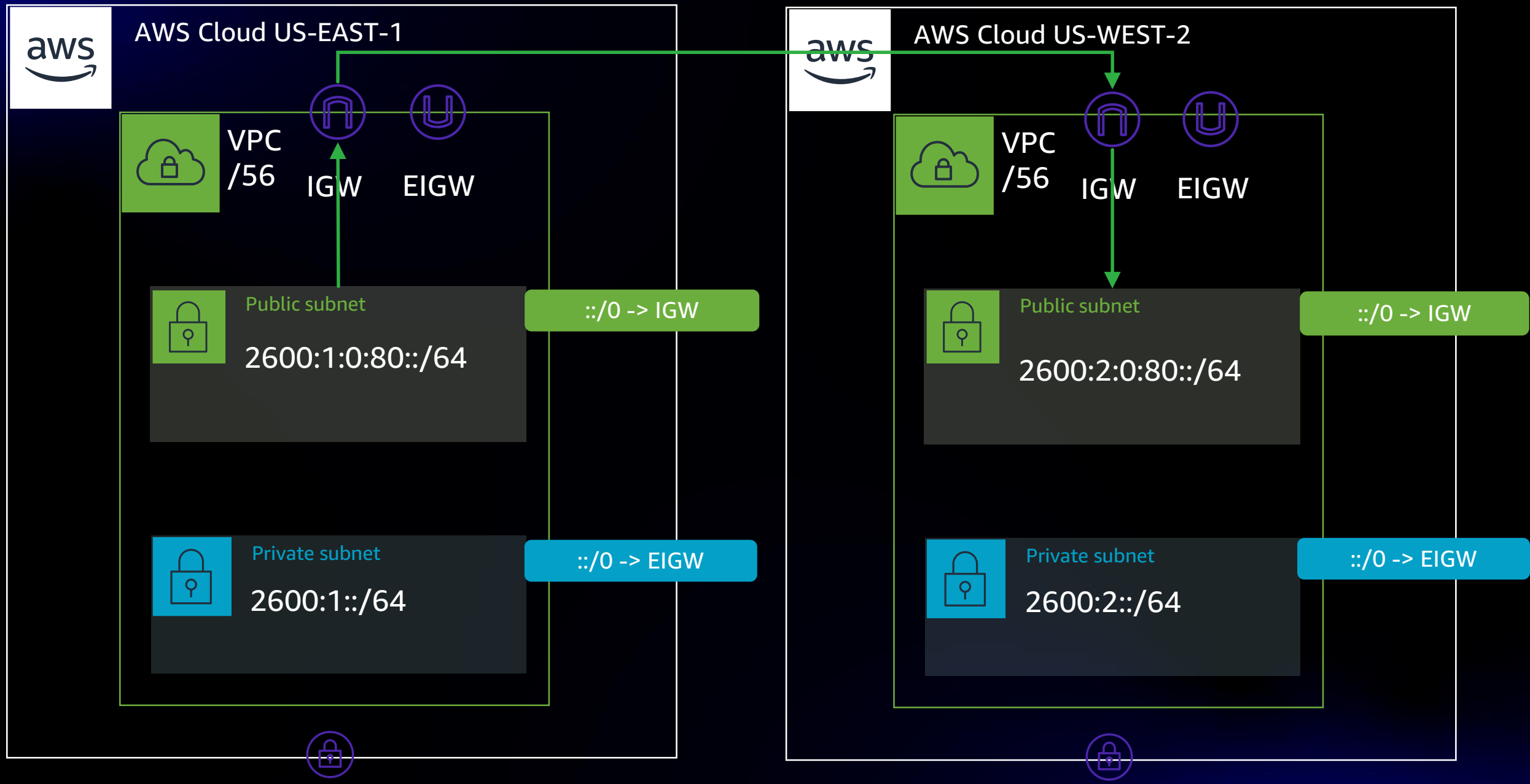
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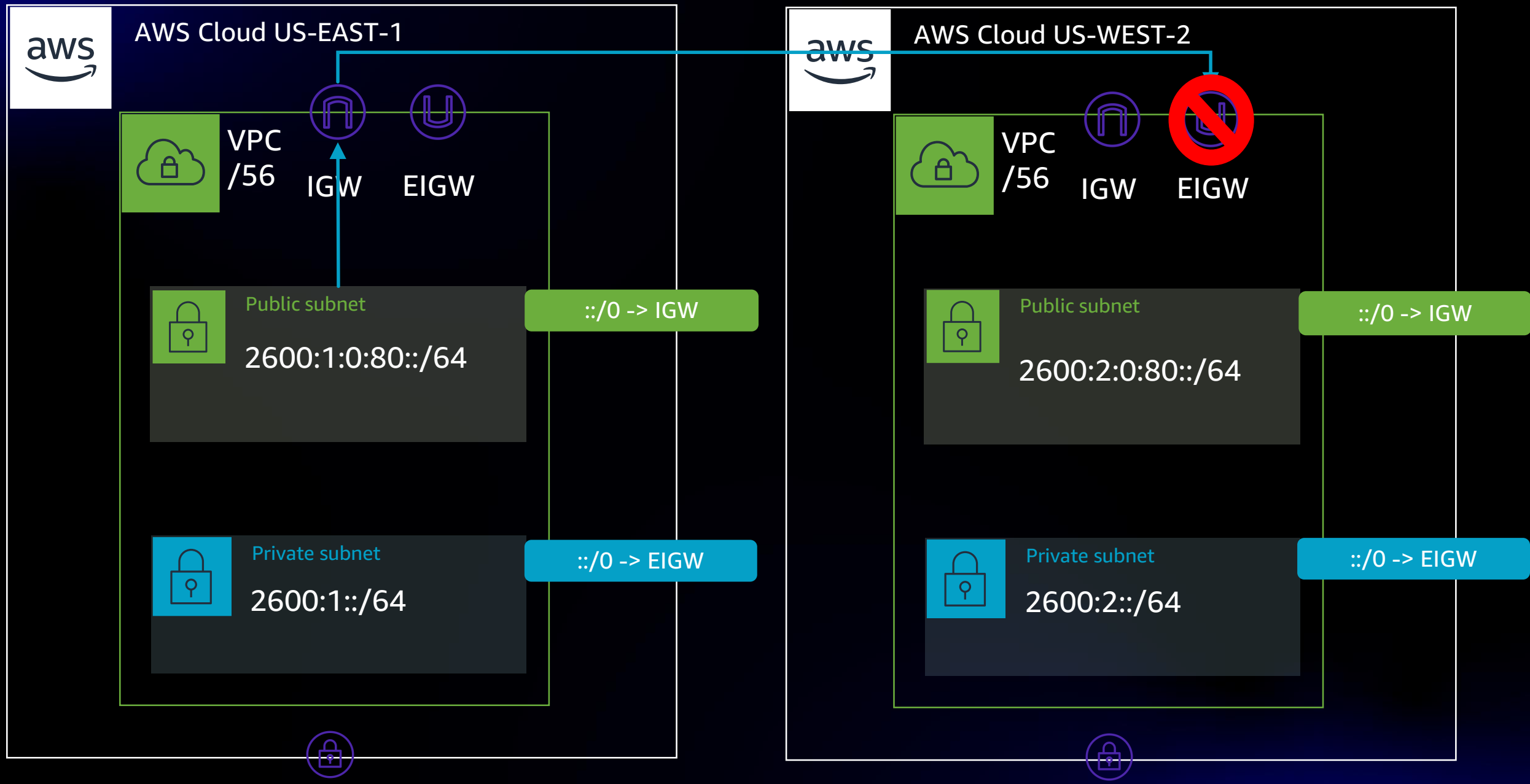
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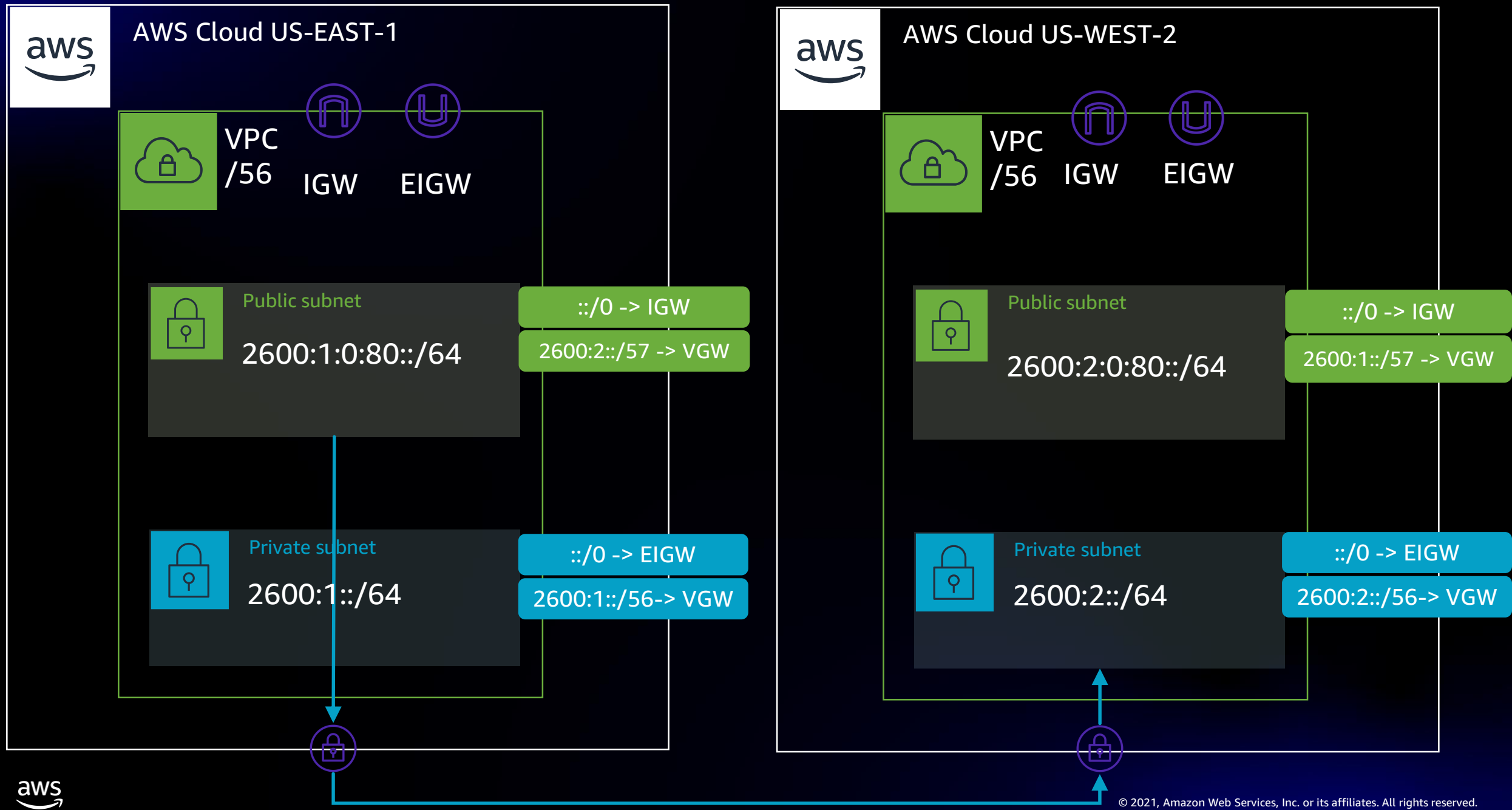
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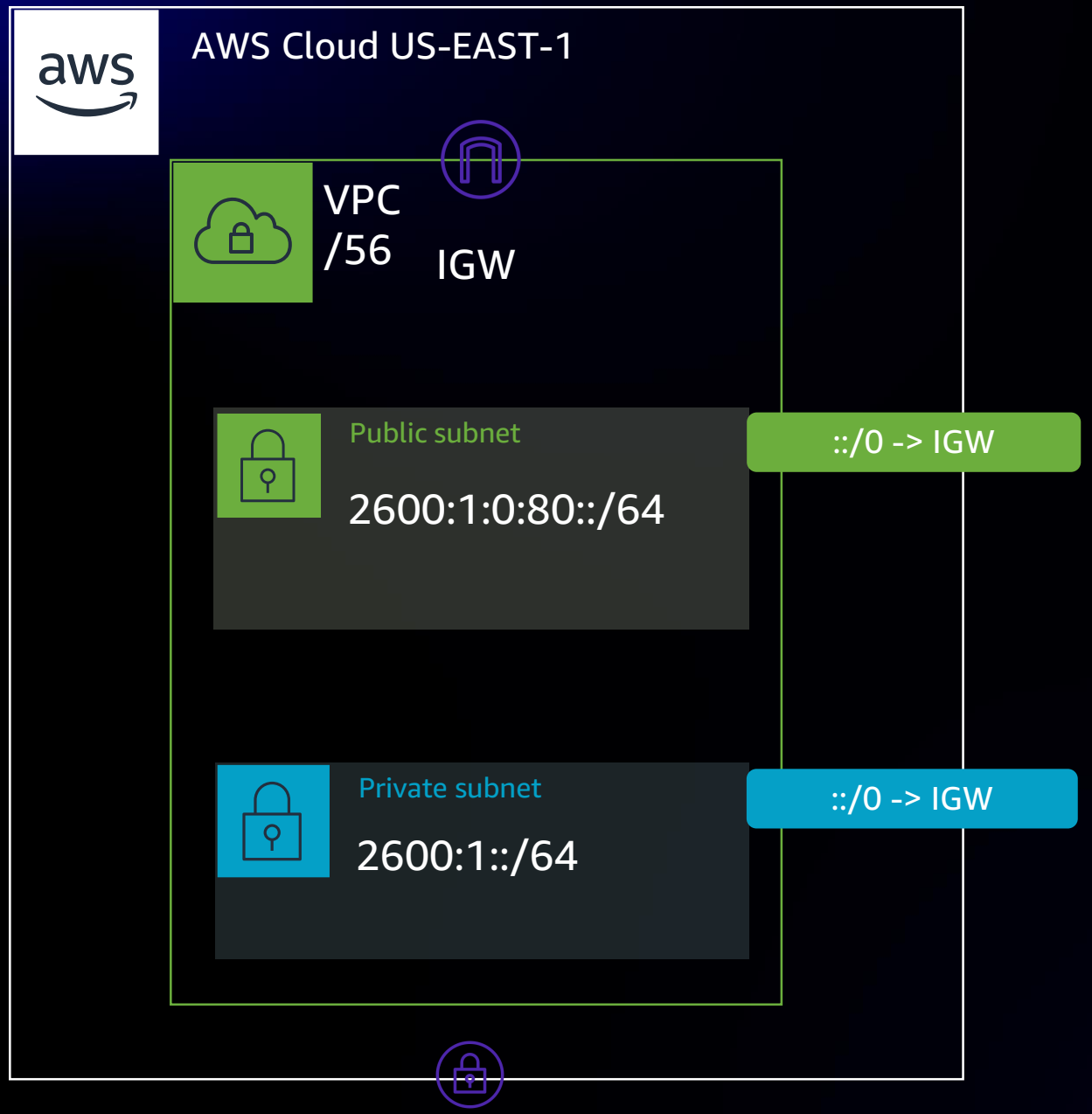
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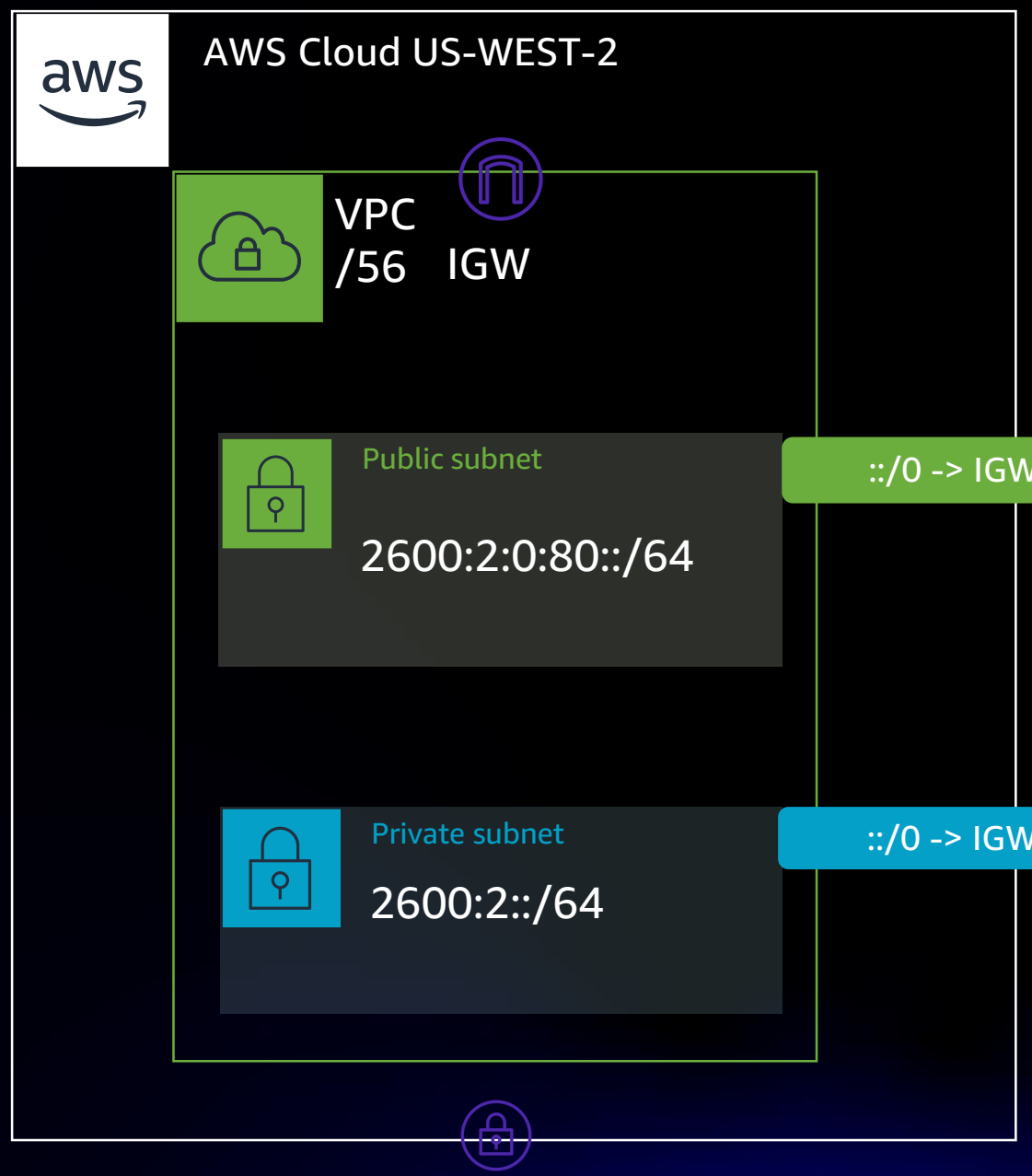


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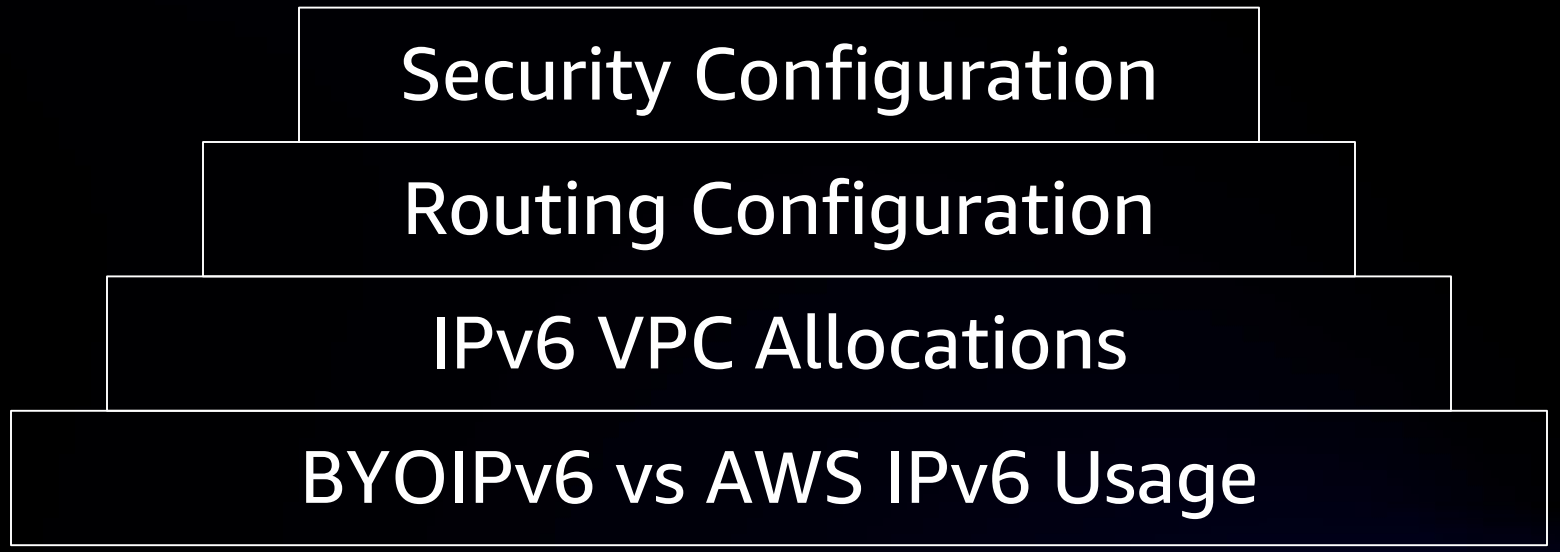


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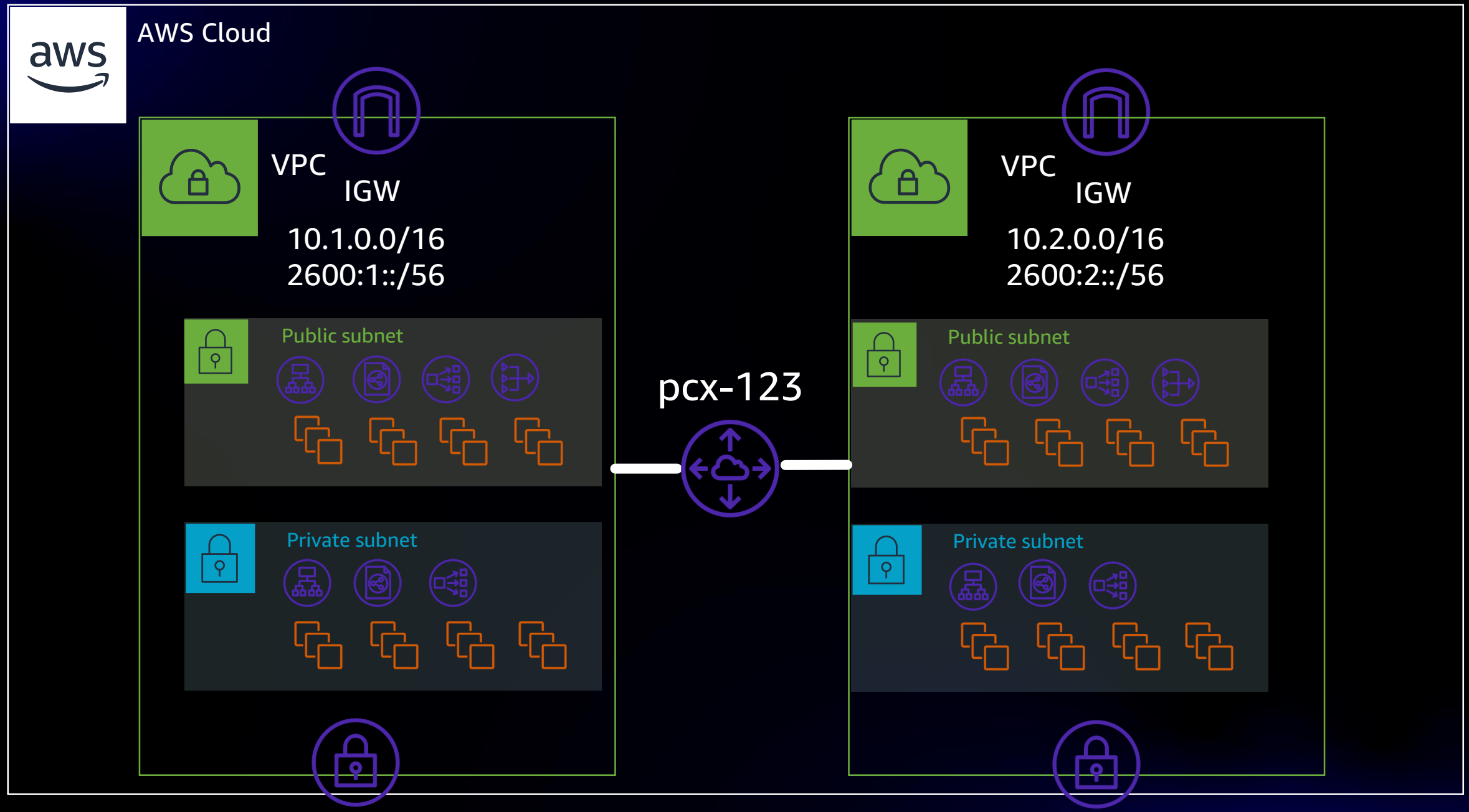




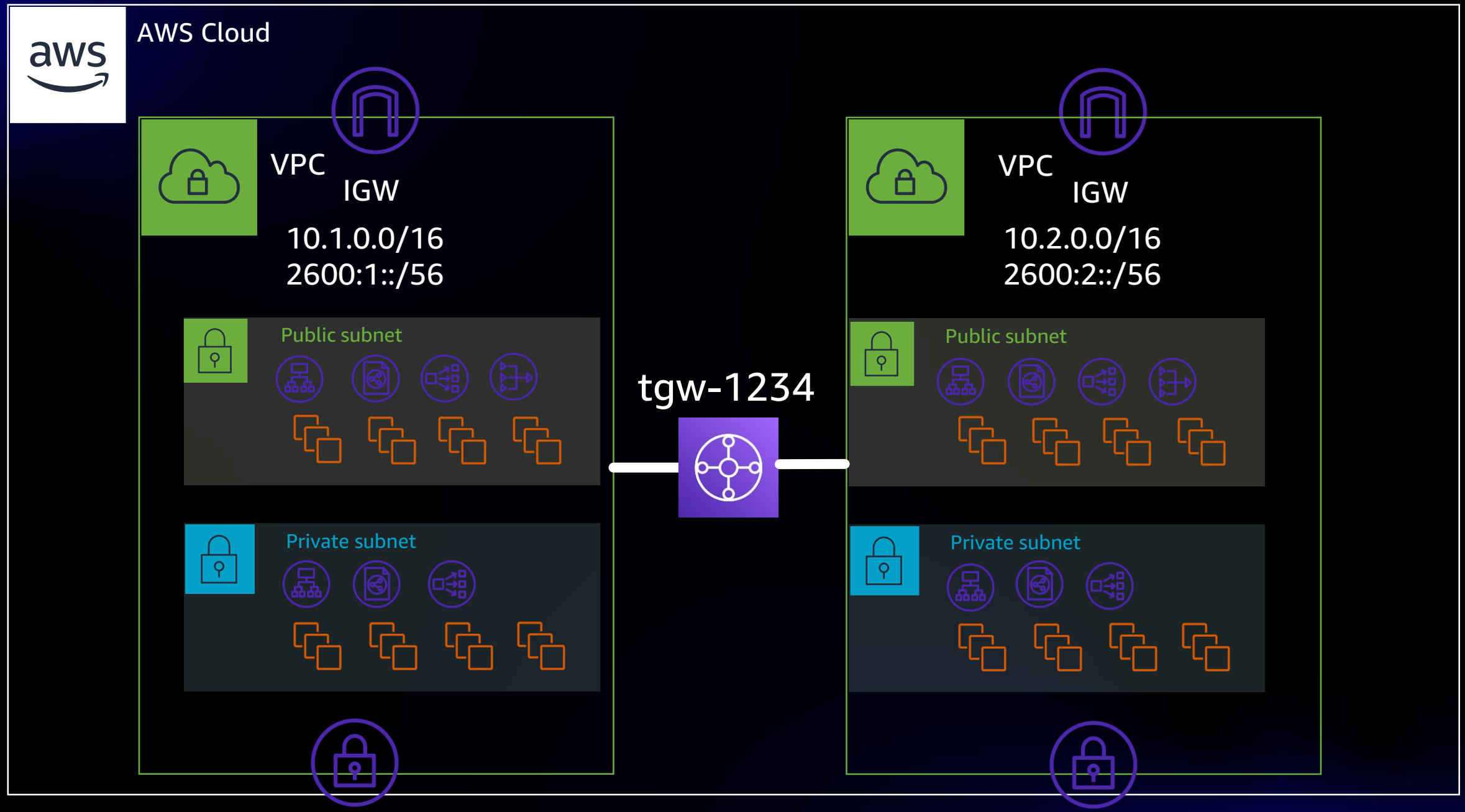
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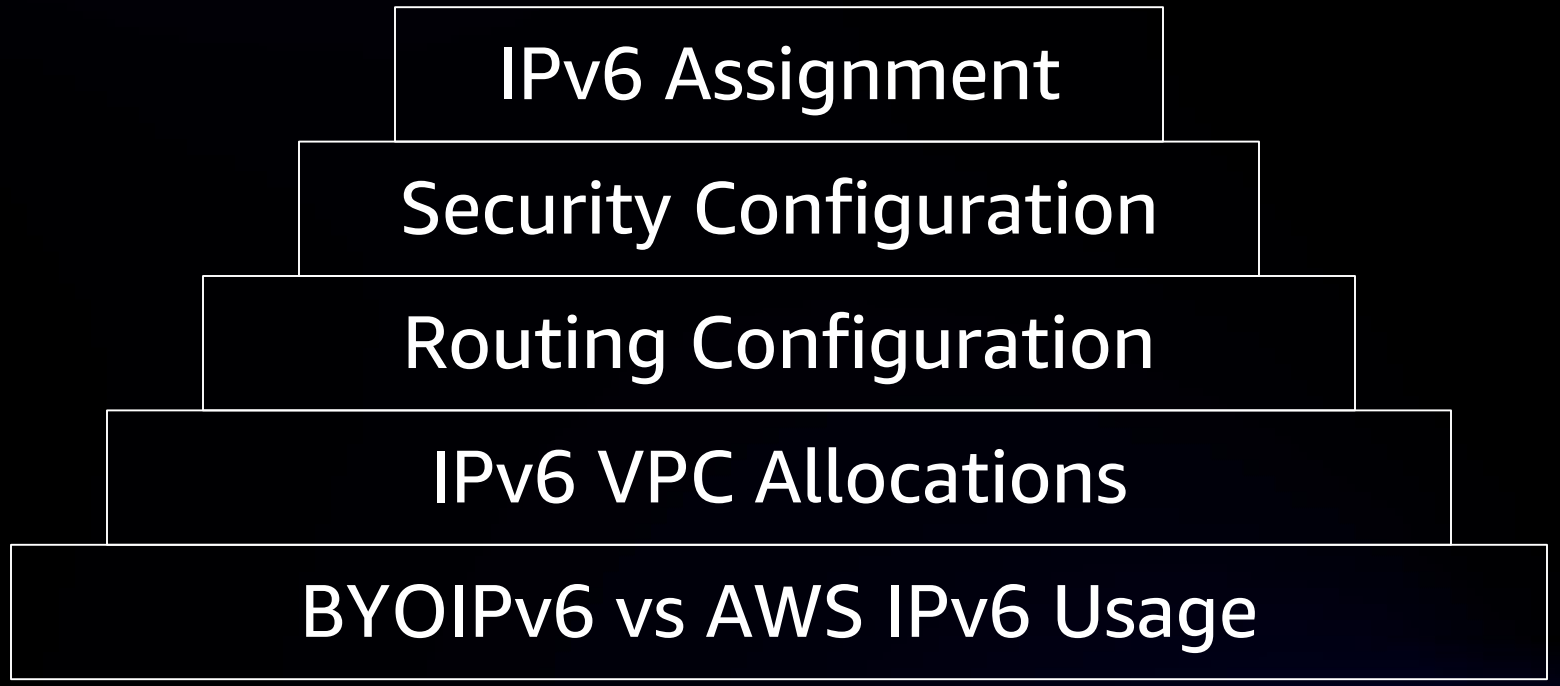


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IP objects


```
[
{
   "id": "0AFE",
   "name": ”reinvent/us-west-1/private",
   "type": "IP_RULES",
   "scope": "global",
   "description": "Object for account reinvent in region us-west-1",
   "lastmodified": 1580505920.1655664,
   "active_version": "0",
   "versions": {
      "0": {
         "active": true,
         "id": "0AFE0",
         "rules": [
            {
               "class": "IpRangeRule",
               "ip": "10.1.0.0/16",
               "description": "CIDR in account reinvent region us-west-1",
               "timestamp": 1580505920.1655118
            },
            {
               "class": "IpRangeRule",
               "ip": "2600:1::/56",
               "description": "CIDR in account reinvent region us-west-1",
               "timestamp": 1580505920.1655655
            }
         ]
      }
   }
}
]
```


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IPv6 assignment



Create a package that allows each instance to assign IPv6



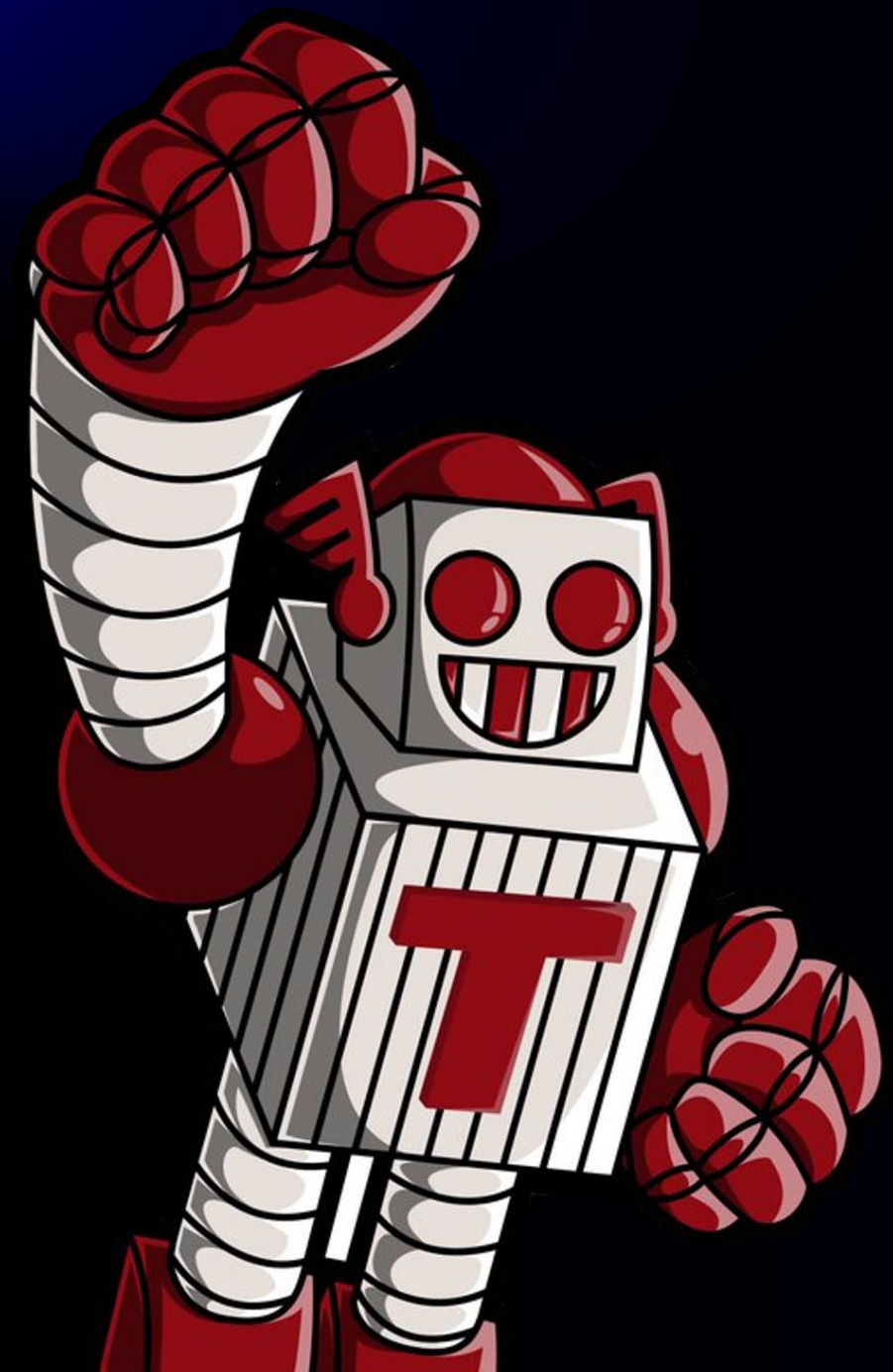
Hit API rate limits

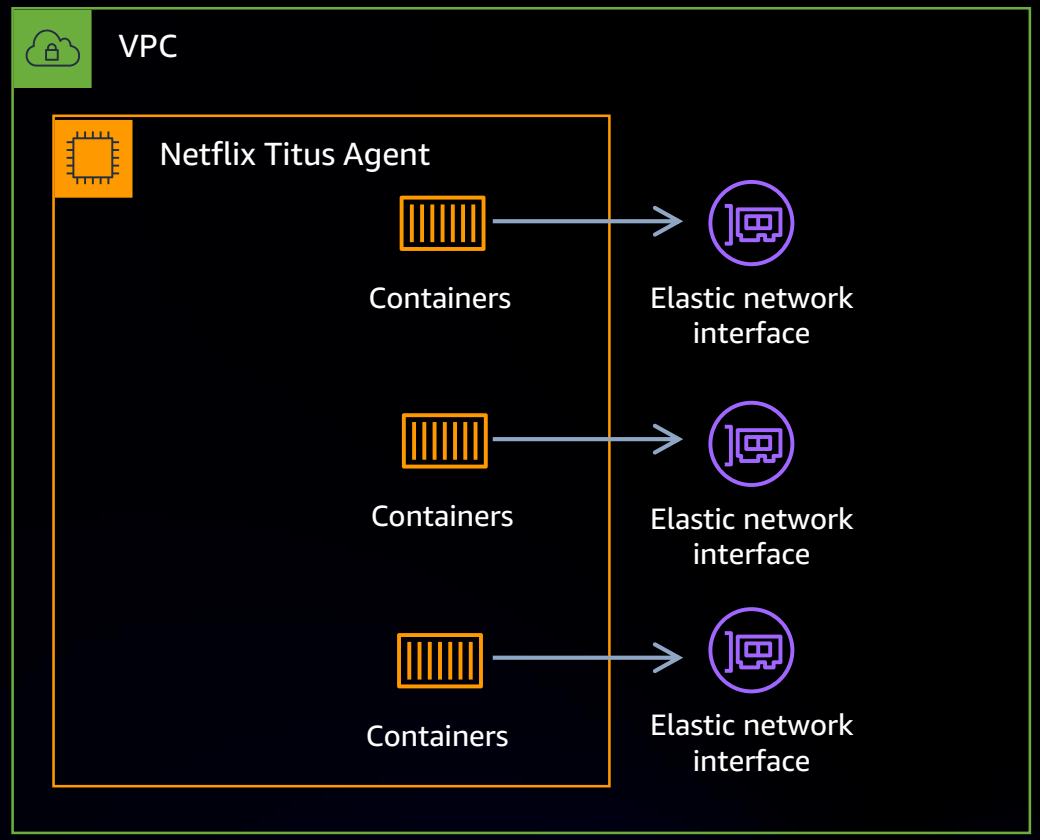


Migrate to using launch templates

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Container network





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Prefix delegation

2001:db8:96::/80



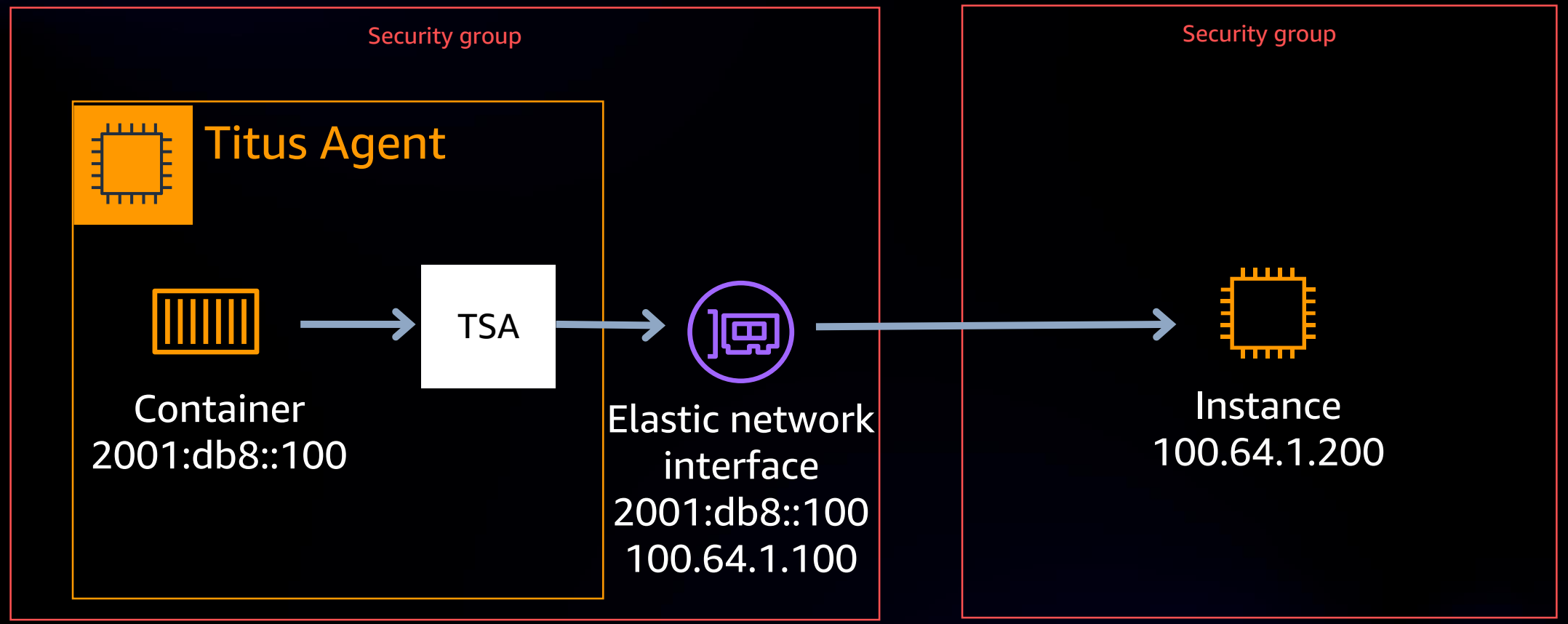
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Network mode

NETFLIX_NETWORK_MODE	IPv4 Ingress	IPv4 Egress	IPv6 Ingress	IPv6 Egress
IPV4_ONLY	✅	✅	❌	❌
DUAL_STACK	✅	✅	✅	✅
IPV6_WITH_TRANSITION	❌	✅	✅	✅
IPV6_ONLY	❌	❌	✅	✅

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IPv6 with transition



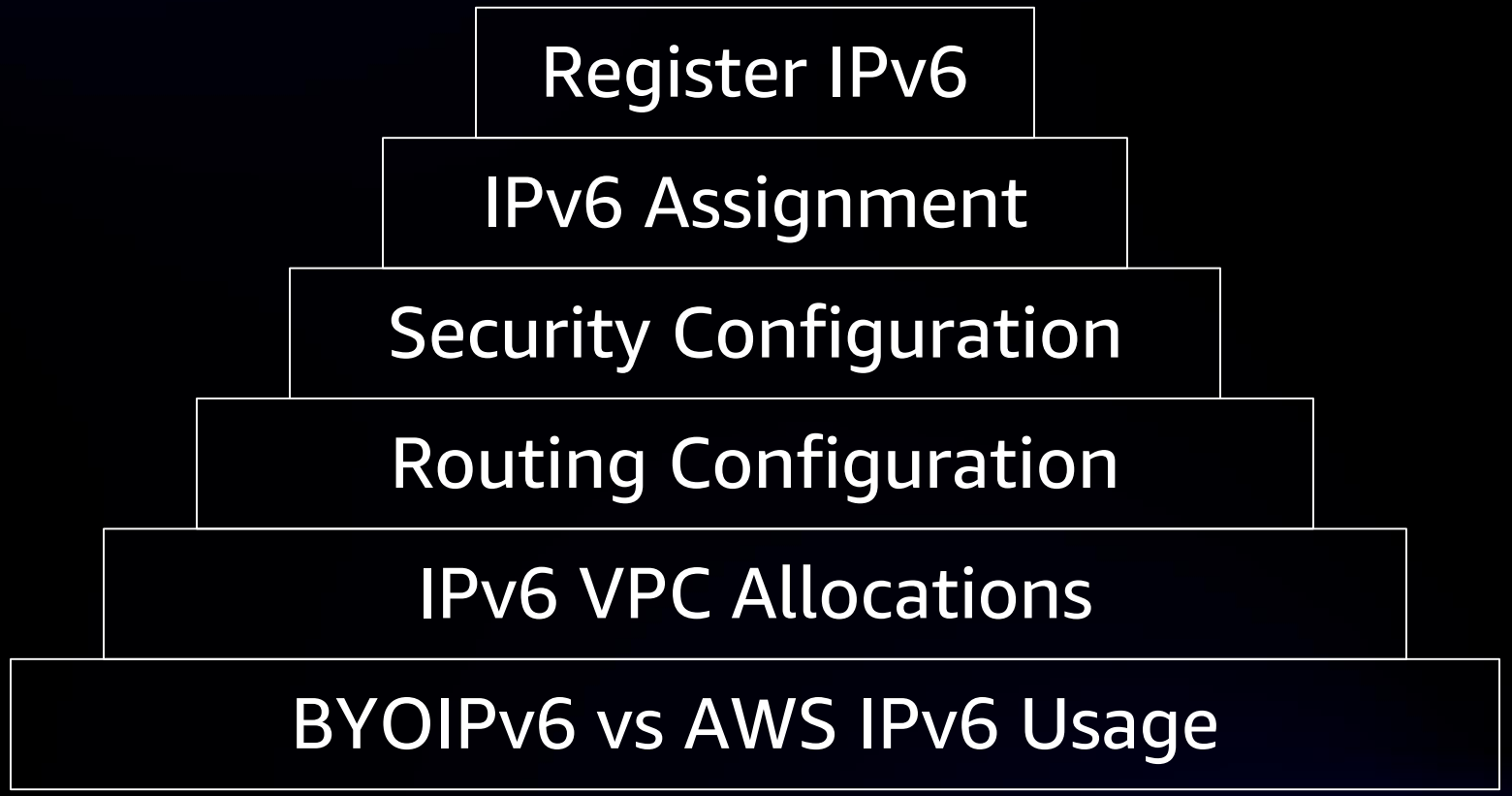
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Subnet CIDR reservations

- Used to reserve IP space to use for prefix delegations
- Ensures that AWS services do not use addresses within a reservation
- We allocate first /80 of a /64 to AWS services

2001:db8:1234:1a00:0001::/80
2001:db8:1234:1a00:0002::/79
2001:db8:1234:1a00:0004::/78
2001:db8:1234:1a00:0008::/77
2001:db8:1234:1a00:0010::/76
2001:db8:1234:1a00:0020::/75
2001:db8:1234:1a00:0040::/74
2001:db8:1234:1a00:0080::/73
2001:db8:1234:1a00:0100::/72
2001:db8:1234:1a00:0200::/71
2001:db8:1234:1a00:0400::/70
2001:db8:1234:1a00:0800::/69
2001:db8:1234:1a00:1000::/68
2001:db8:1234:1a00:2000::/67
2001:db8:1234:1a00:4000::/66
2001:db8:1234:1a00:8000::/65

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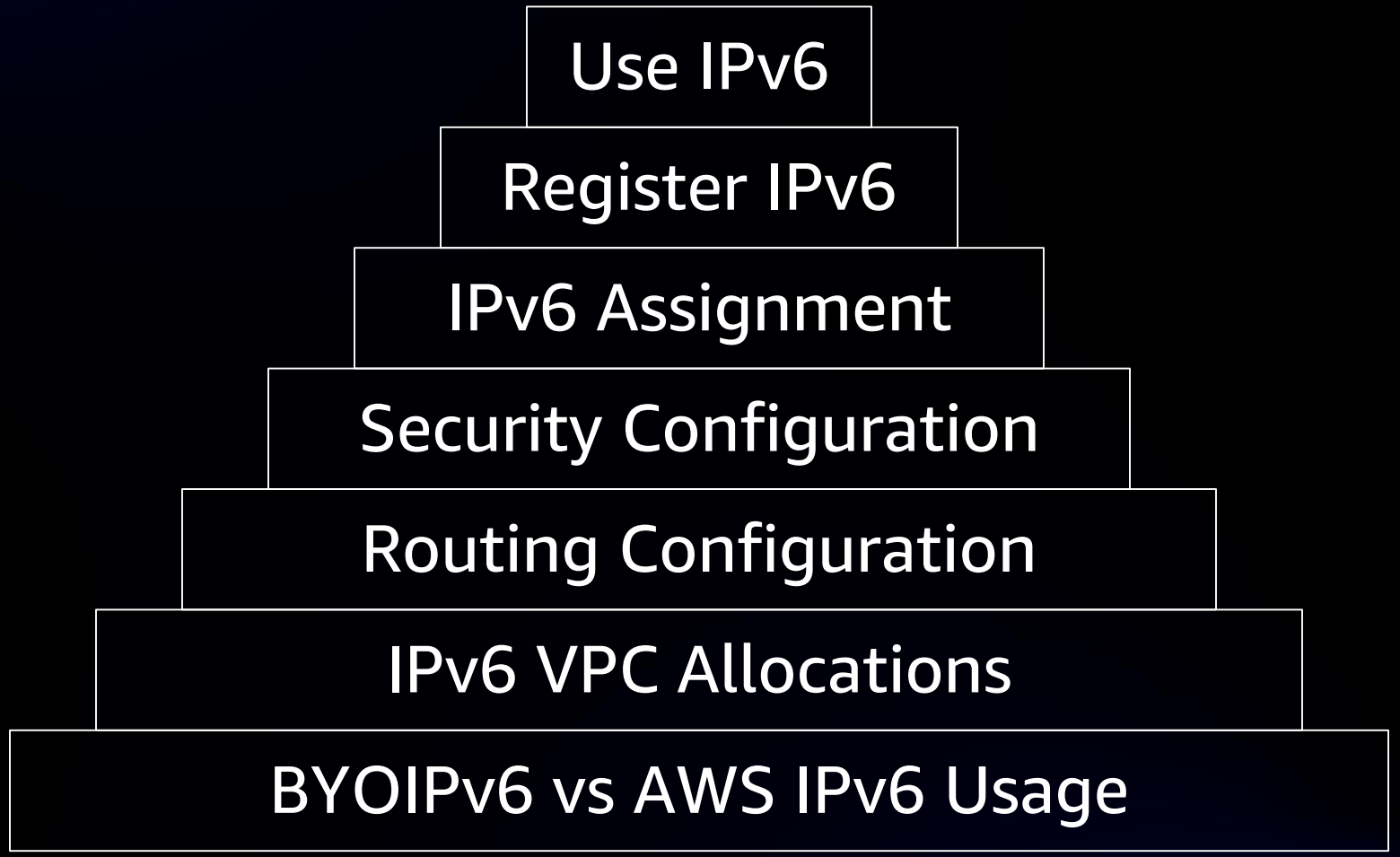


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Discovery registration

```
},
      "metadata": {
        "ec2InstanceId": "i-someid",
        "netflix.detail": "classic",
        "imageId": "ami-someid",
        "appType": "shrimpi.generic",
        "ipv6": “2001:db8:1234:d503:c0de:15e7:3952:db3b",
        "netflix.stack": "bionic"
      }
    }
```

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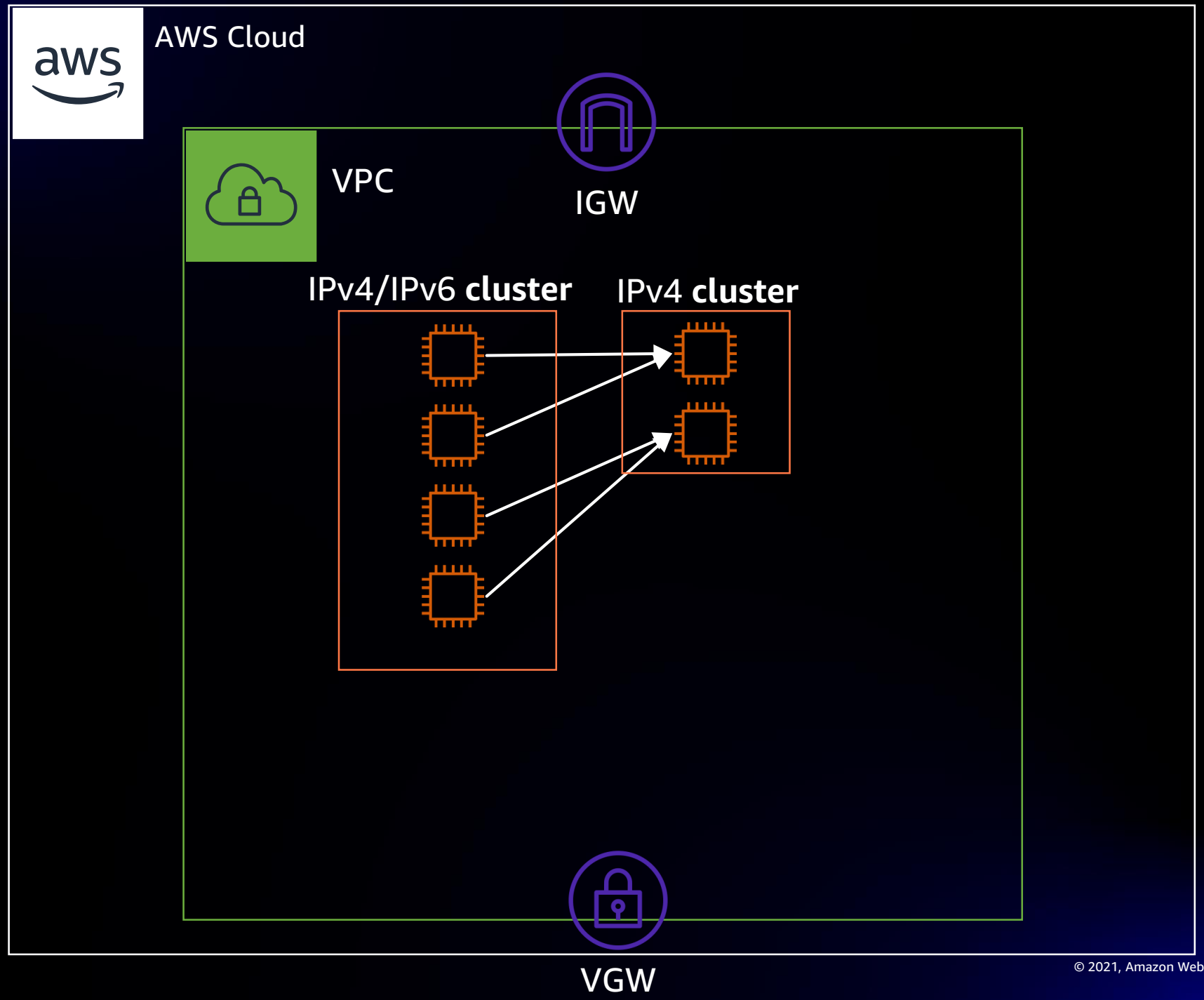
Application changes

- SSH/bastion access
- Runtime updates (Java)
- Sidecar updates
- Accelerate migrations

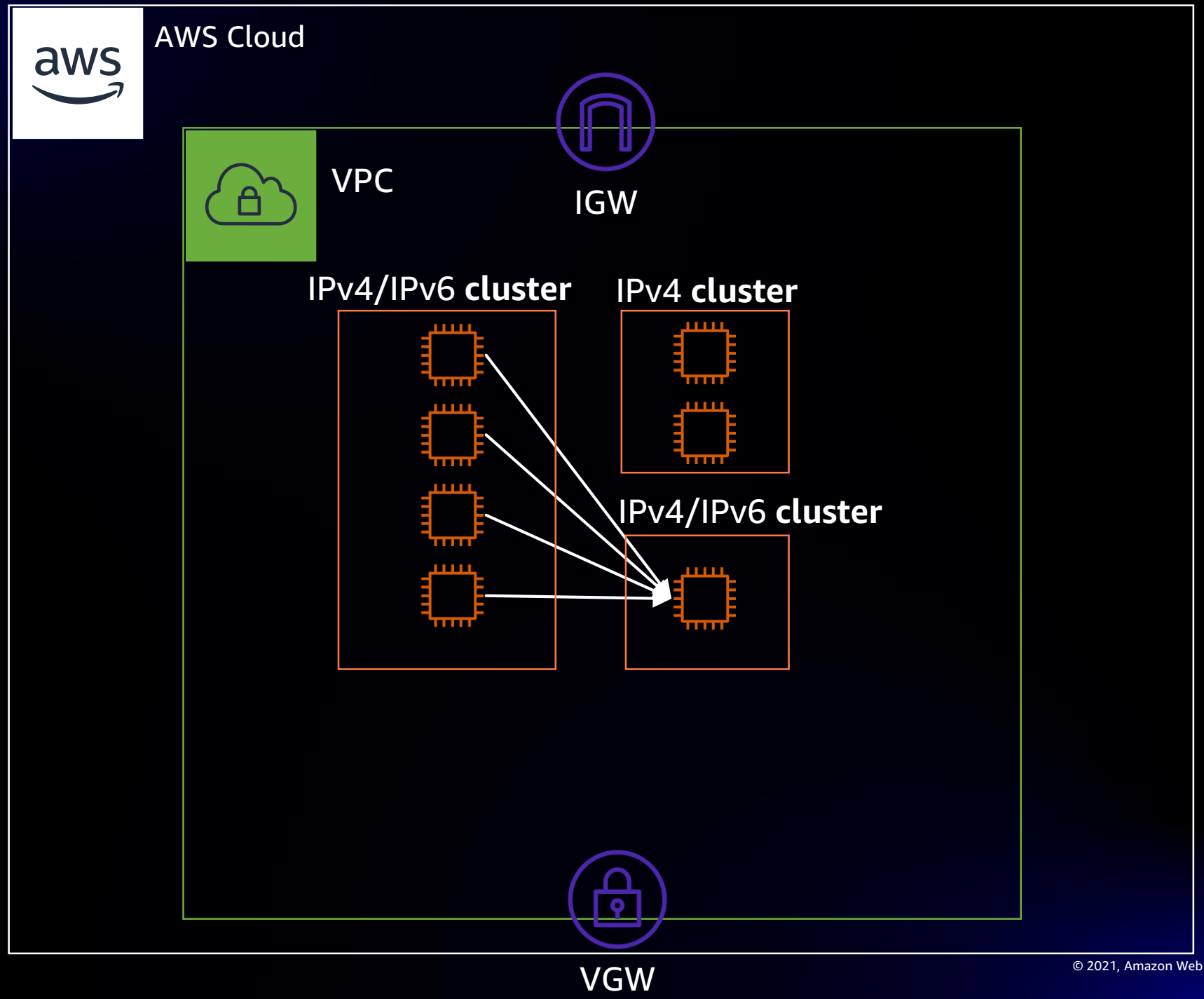
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Thank you!

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