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Driving Agile Networks

In The Cloud Era

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Agenda

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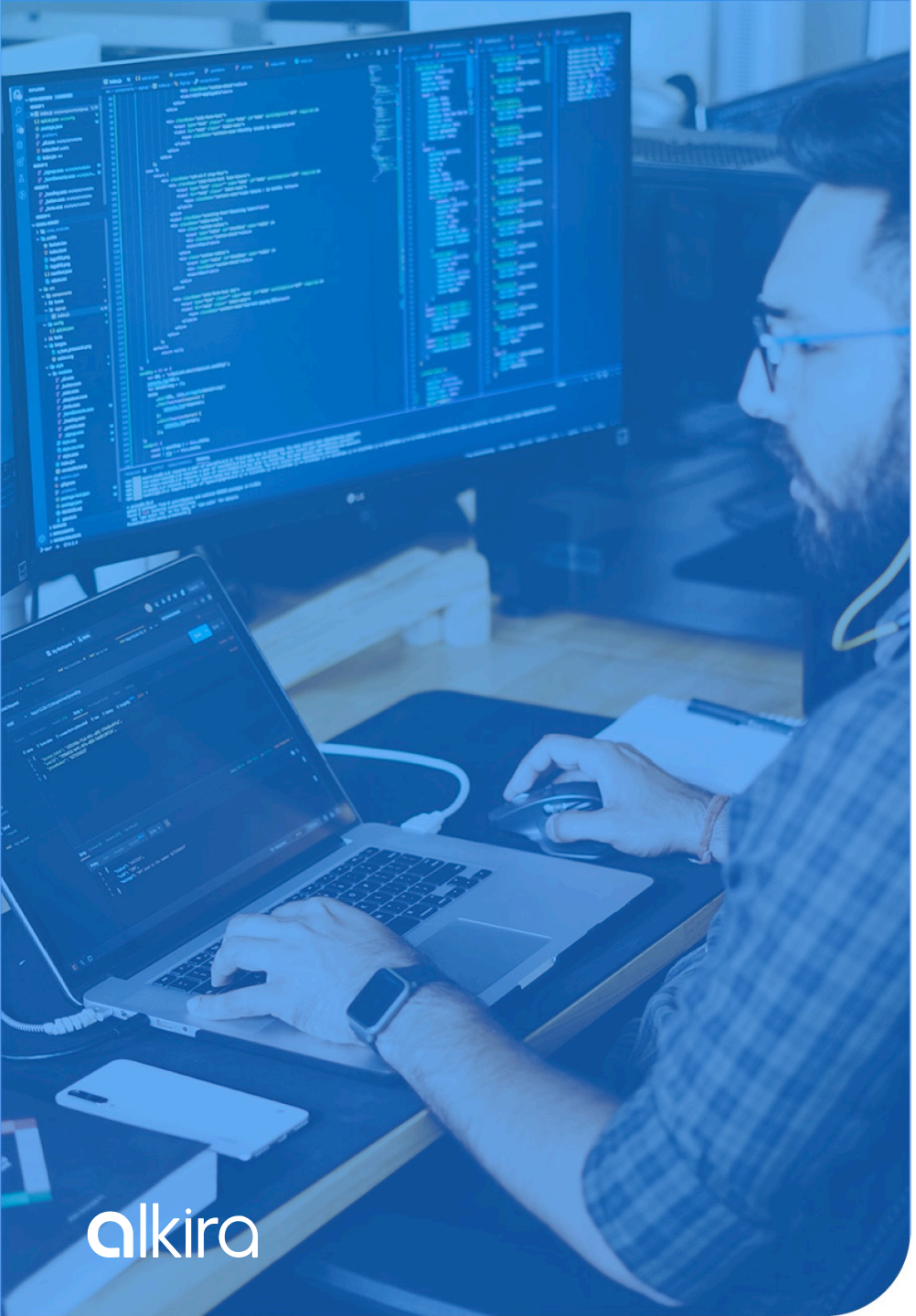


Network Automation ***Today***

Failing To Prepare Is Preparing To Fail

- Benjamin Franklin

Framing The Discussion

Edge

Close to end-users and devices; Facilitates transport between endpoints and core network

Network
(Transport)

MPLS

SD-WAN

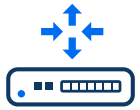
VPN

IPsec

DX/ER/IC

Cloud

Networking exclusive to a public cloud; Interconnection to SaaS, CoLos, and Remote Sites

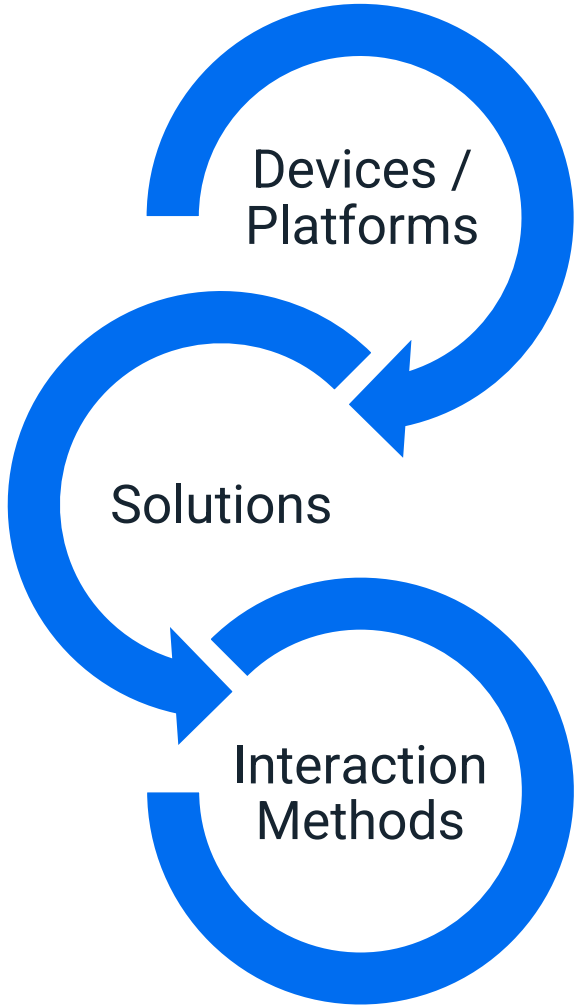


Core

Interconnects different networks together, handles aggregation, and governs service invocation

Understanding The Landscape

NetDevOps - *Survey*

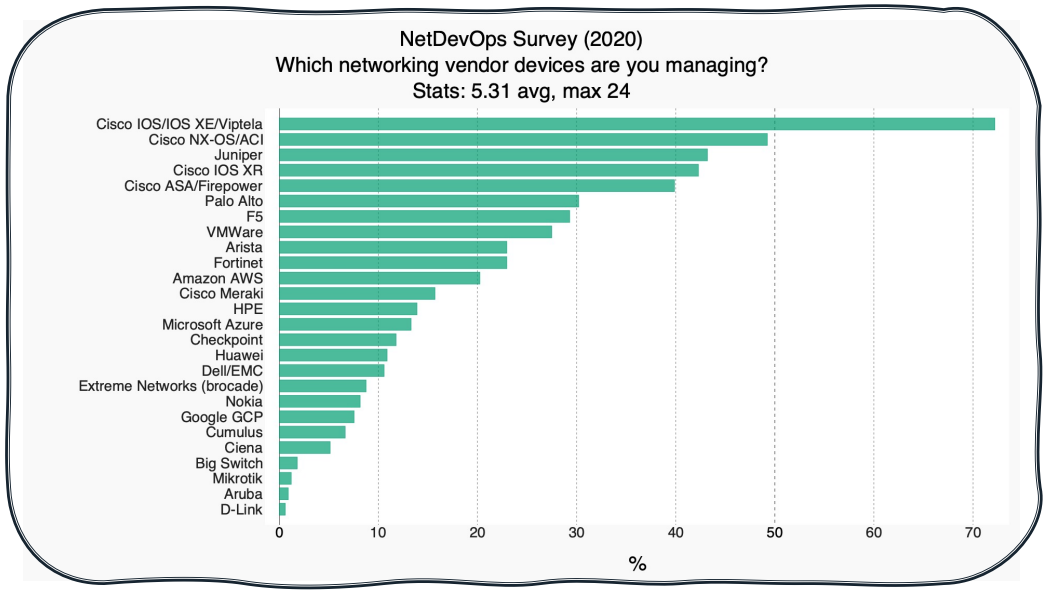


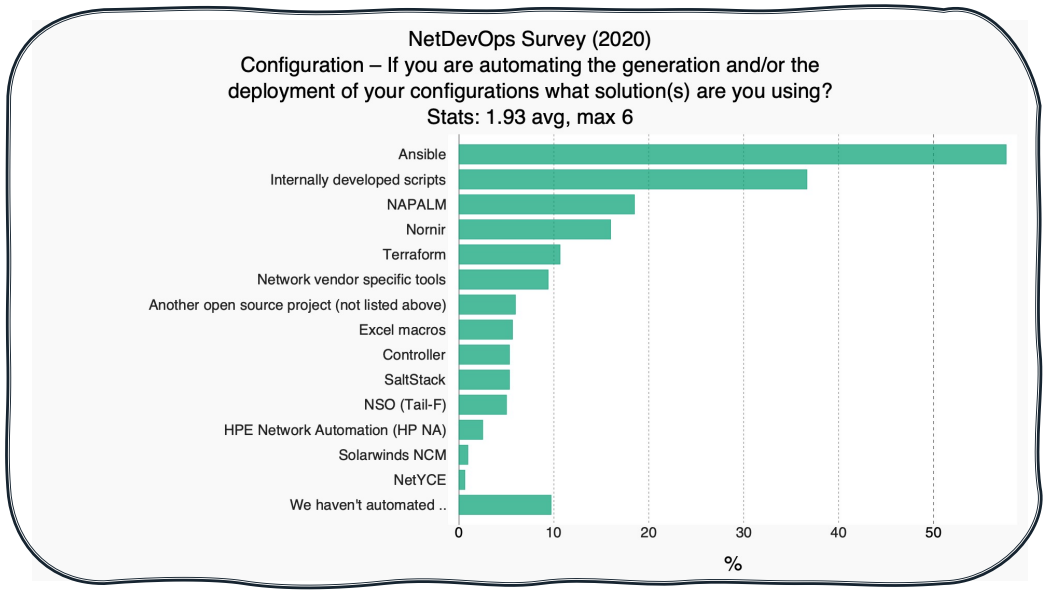
Participants use **5.31 avg** *(24 max)* unique vendor devices / platforms

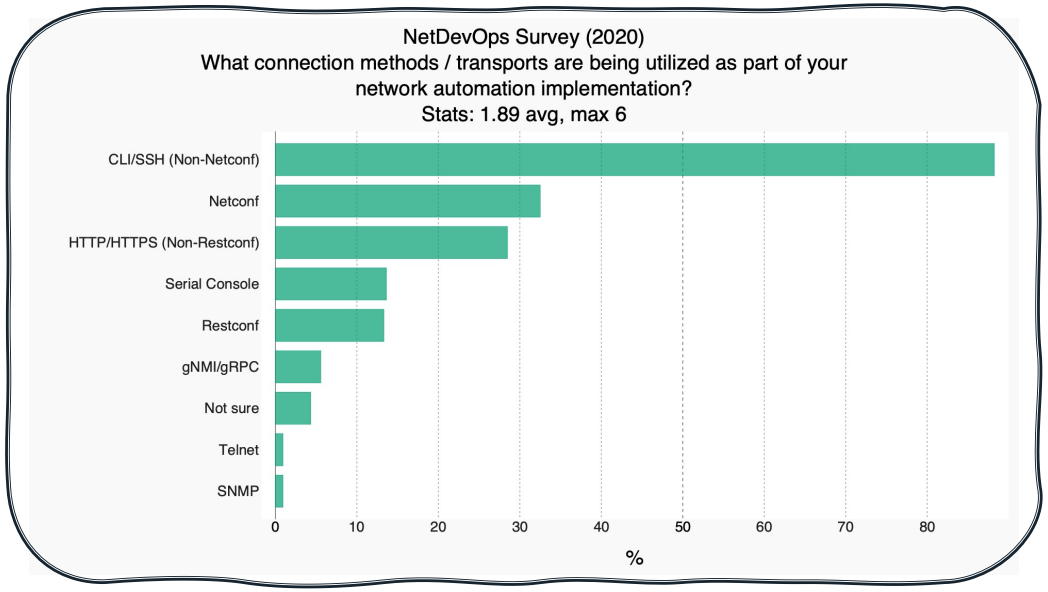
Up to **6 different** solutions are being used for generating and / or deploying configuration to devices / platforms

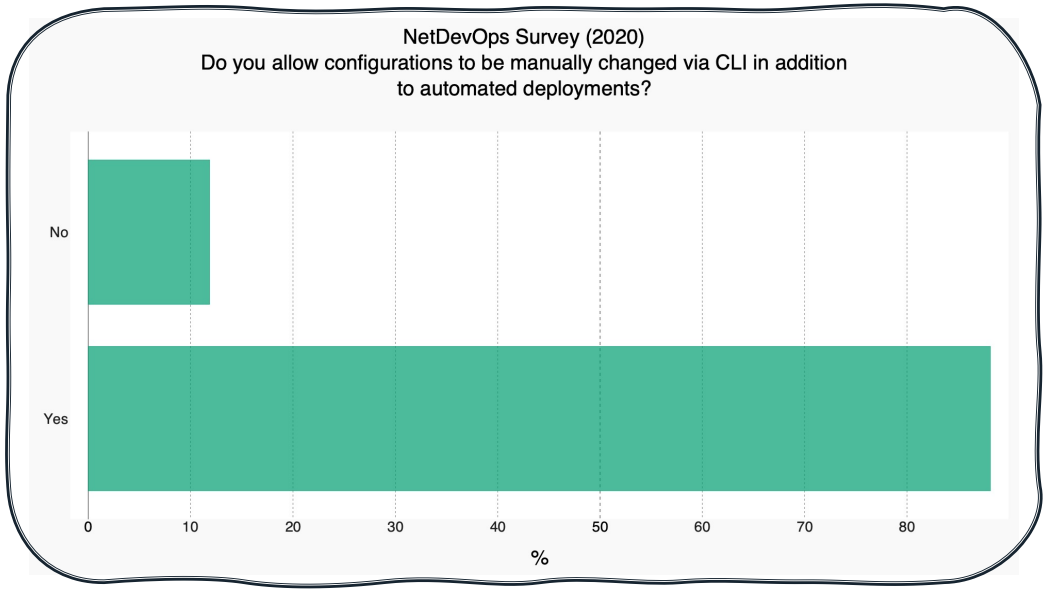
Those solutions use as many as **6 unique** methods to interact with devices / platforms

Understanding The Landscape *(cont.)*







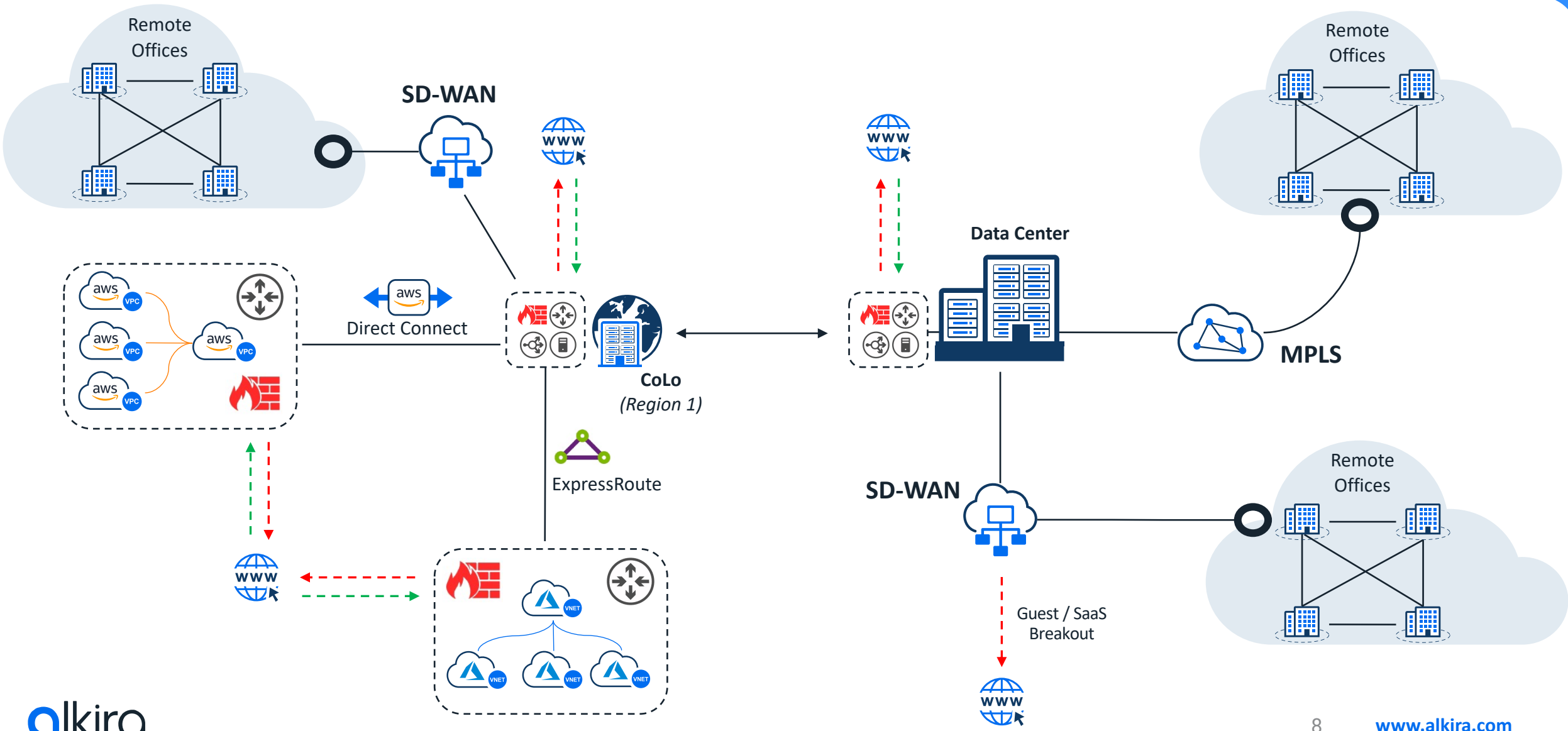


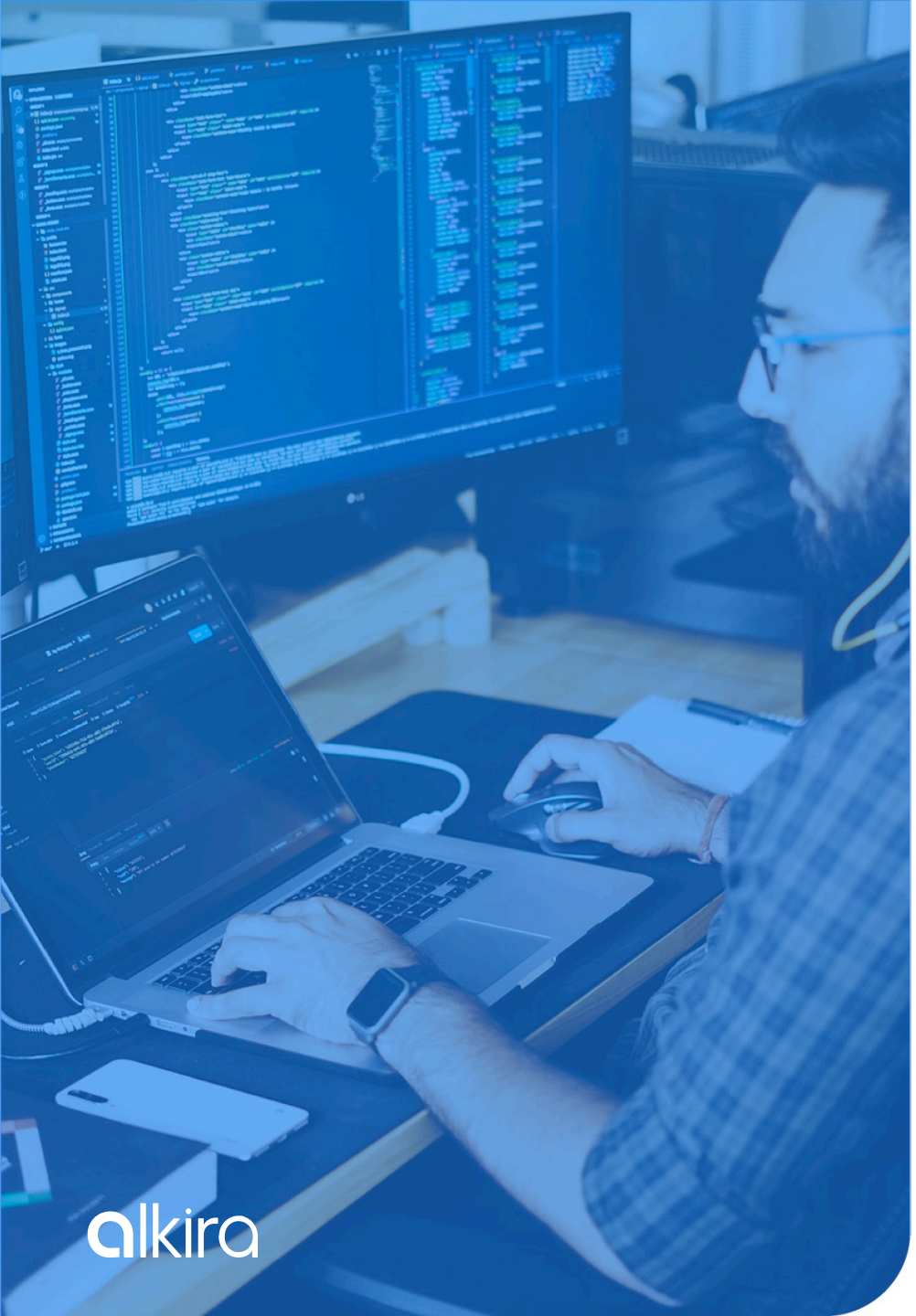
Attributes Of Automation Today

Why Are Things The Way They Are?

Tightly Coupled	Components have heavy dependence on each other; The blast radius is large in outage events, causing a decrease in overall changes
Mutable Infrastructure	Physical or virtual network devices are configured, updated, or modified in place at runtime; This causes significant configuration drift over time, leading to environment inconsistency
Vertically Scaled	Legacy network infrastructure scales by increasing the capacity of individual nodes on the network. Scaling-up focuses on maximizing the power of individual devices like a set of firewalls or routers
Inconsistent Interaction Surfaces	Enterprise networks consist of numerous vendors, hardware models, and software versions. CLI and API interaction surfaces vary in functionality and interoperability, leading to a combination of manual intervention, scripts, and disjointed tooling

Network Evolution *(Pre-Cloud)*



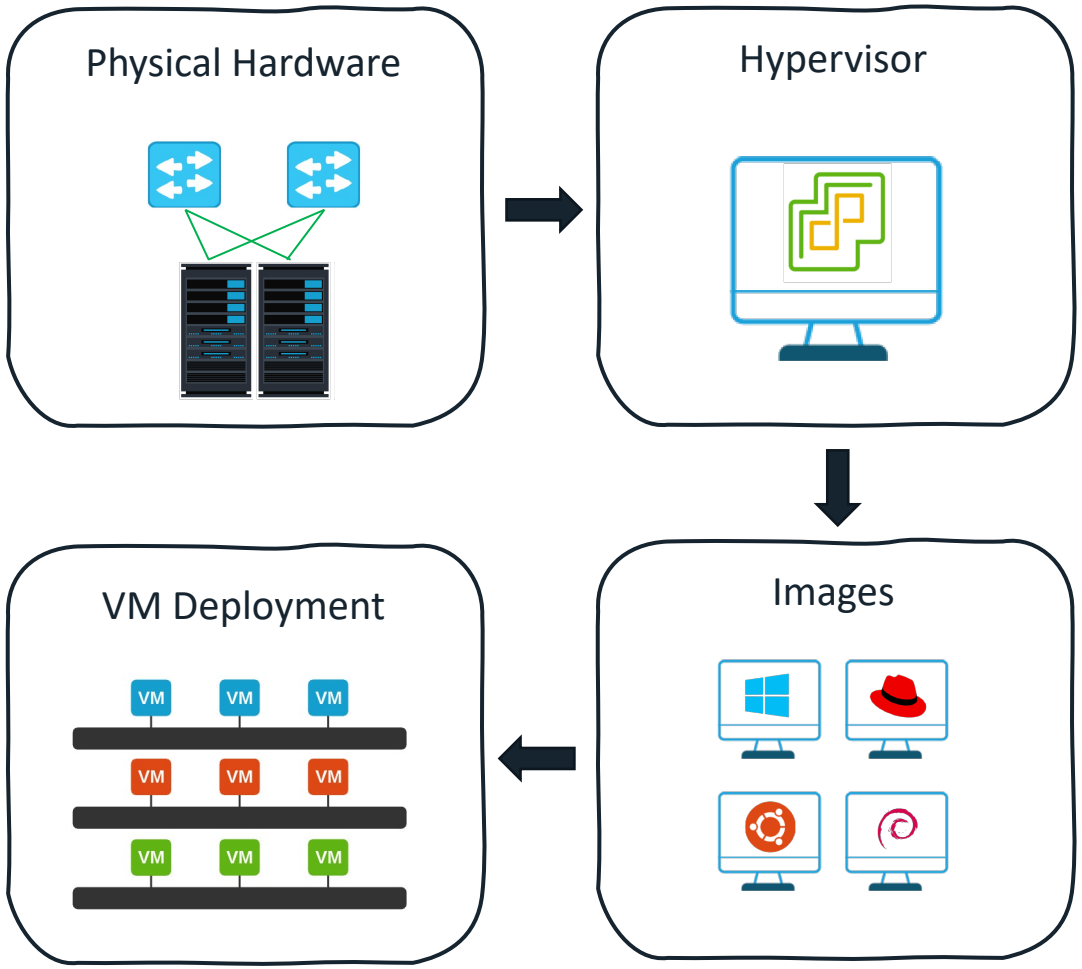


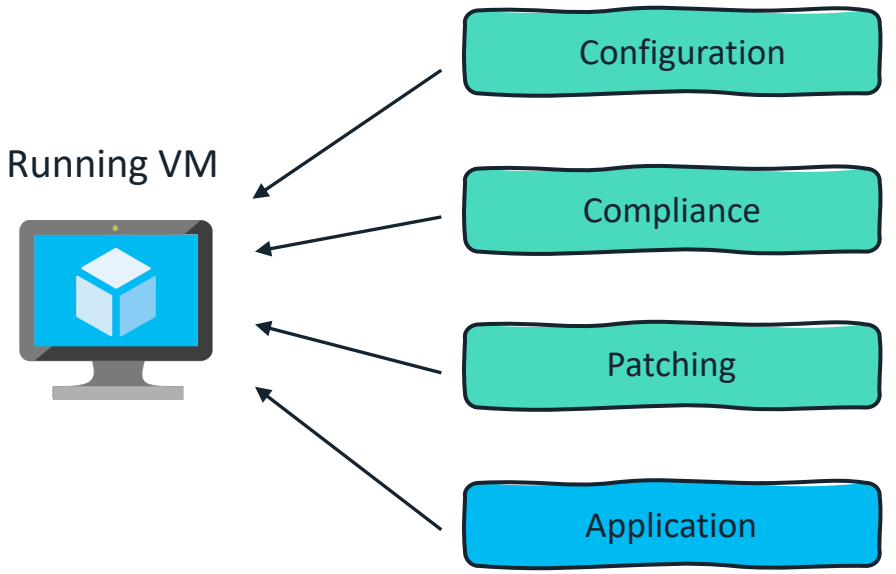
Rethinking Automation For ***Cloud***

> *It's not the upfront capital that kills you, it's the operations and maintenance on the back end.*
>
> **- Gene Kim**

Infrastructure Management *(Pre-Cloud)*

From ***conception*** to ***production***

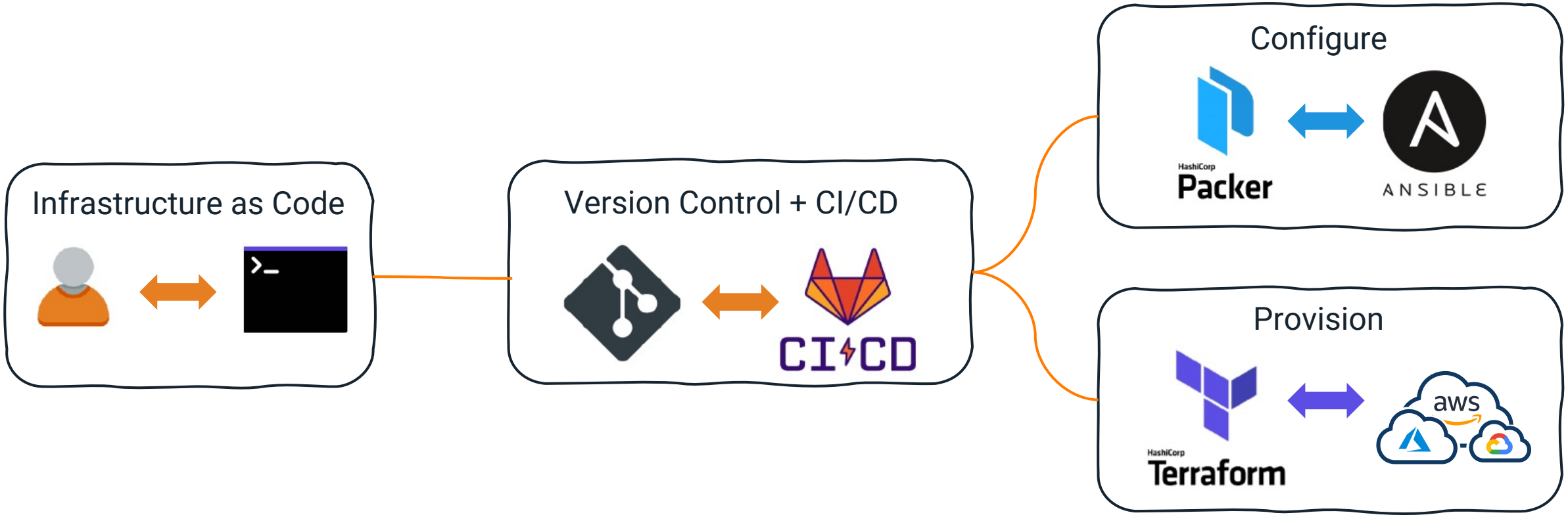




Attributes Of Cloud Grade Automation

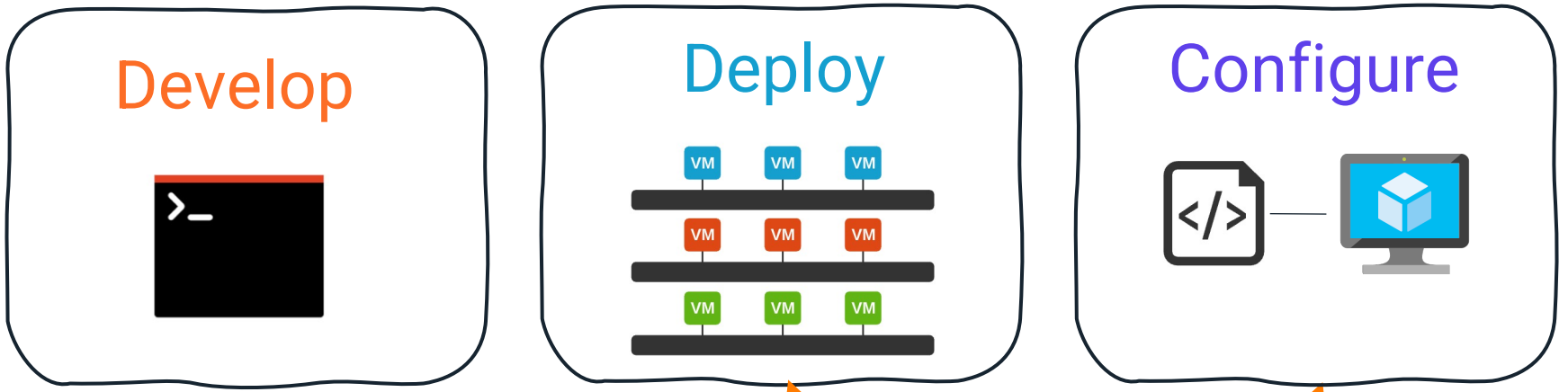
Tightly Coupled	Mutable Infrastructure	Vertically Scaled	Inconsistent Interaction Surfaces
Loosely Coupled	**Immutable Infrastructure**	**Horizontally Scaled**	**Consistent Interaction Surfaces**
Components are detached, enabling them to work independently of each other as part of a larger group of systems; Blast radius is reduced	Cloud infrastructure is configured at build-time; This reduces the number of moving pieces at run-time, increasing environment consistency	In the cloud, overall capacity is increased by adding additional nodes, usually of equivalent capacity; Scaling-out shifts focus to combining the resources of many nodes together	Infrastructure is provisioned with proprietary or cloud-agnostic tool; This provides the same interaction experience across infrastructure products

How Did ***Cloud*** Change Things?

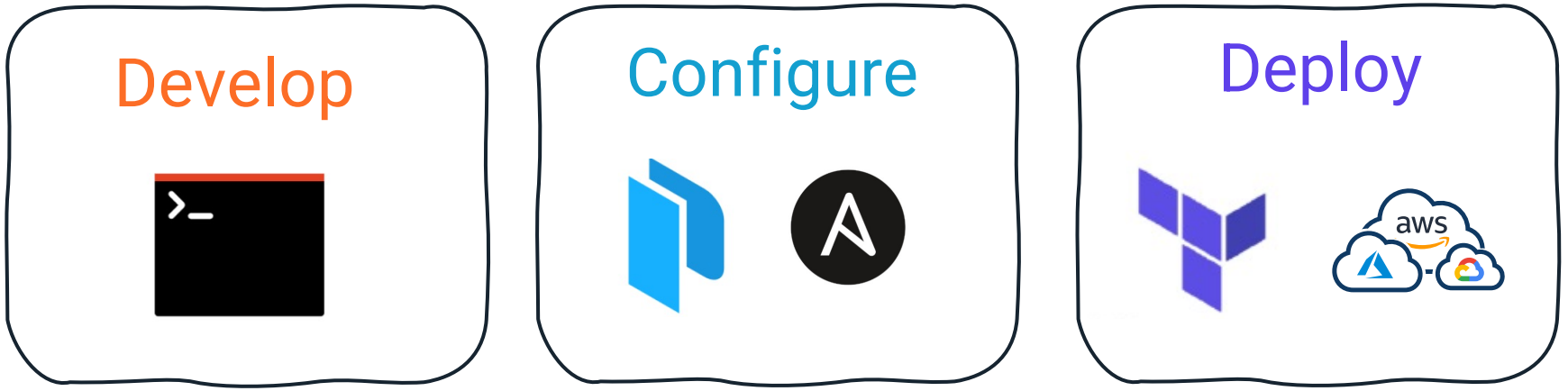


Shifting Logic From *Run-Time* To *Build-Time*

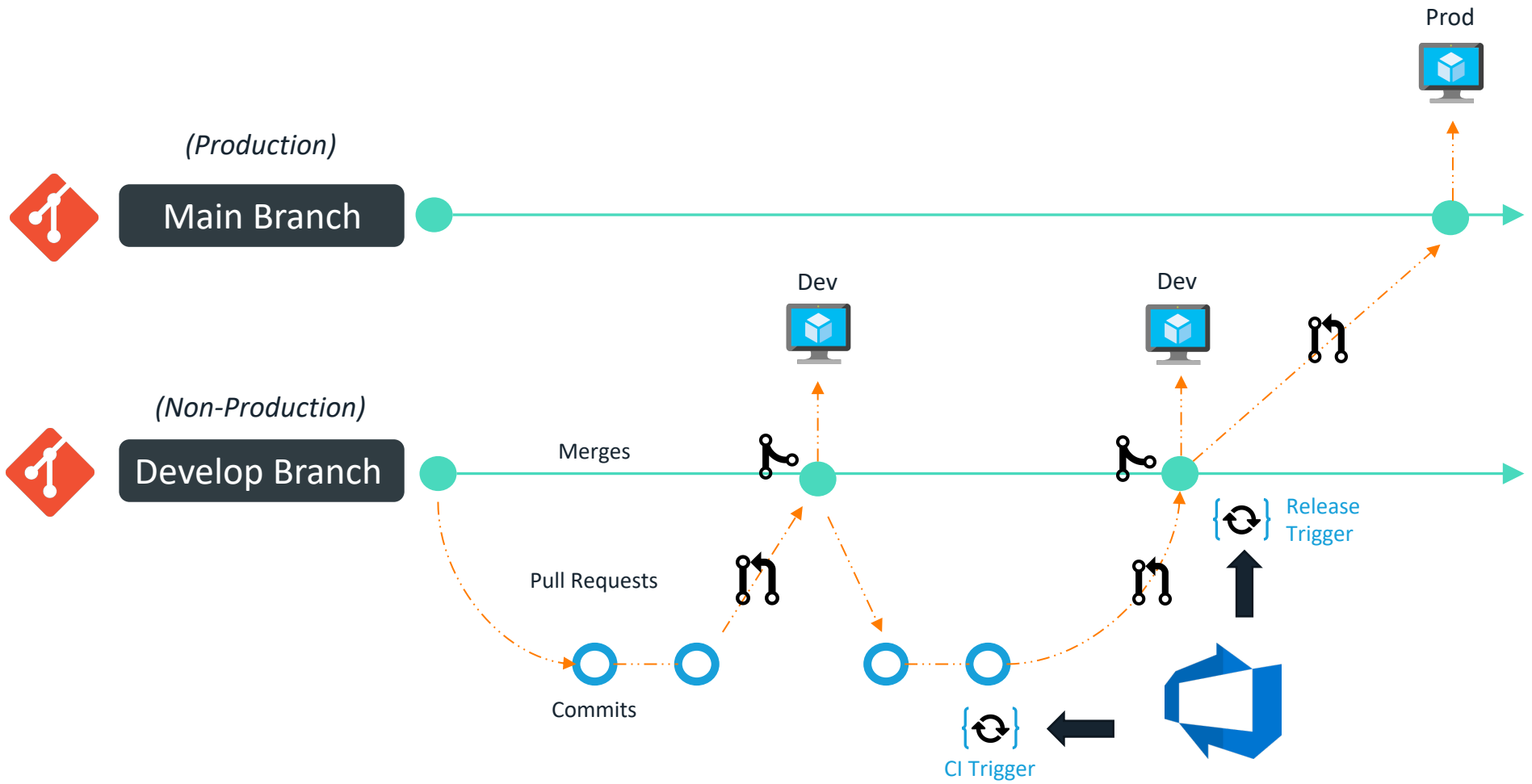
Run-Time

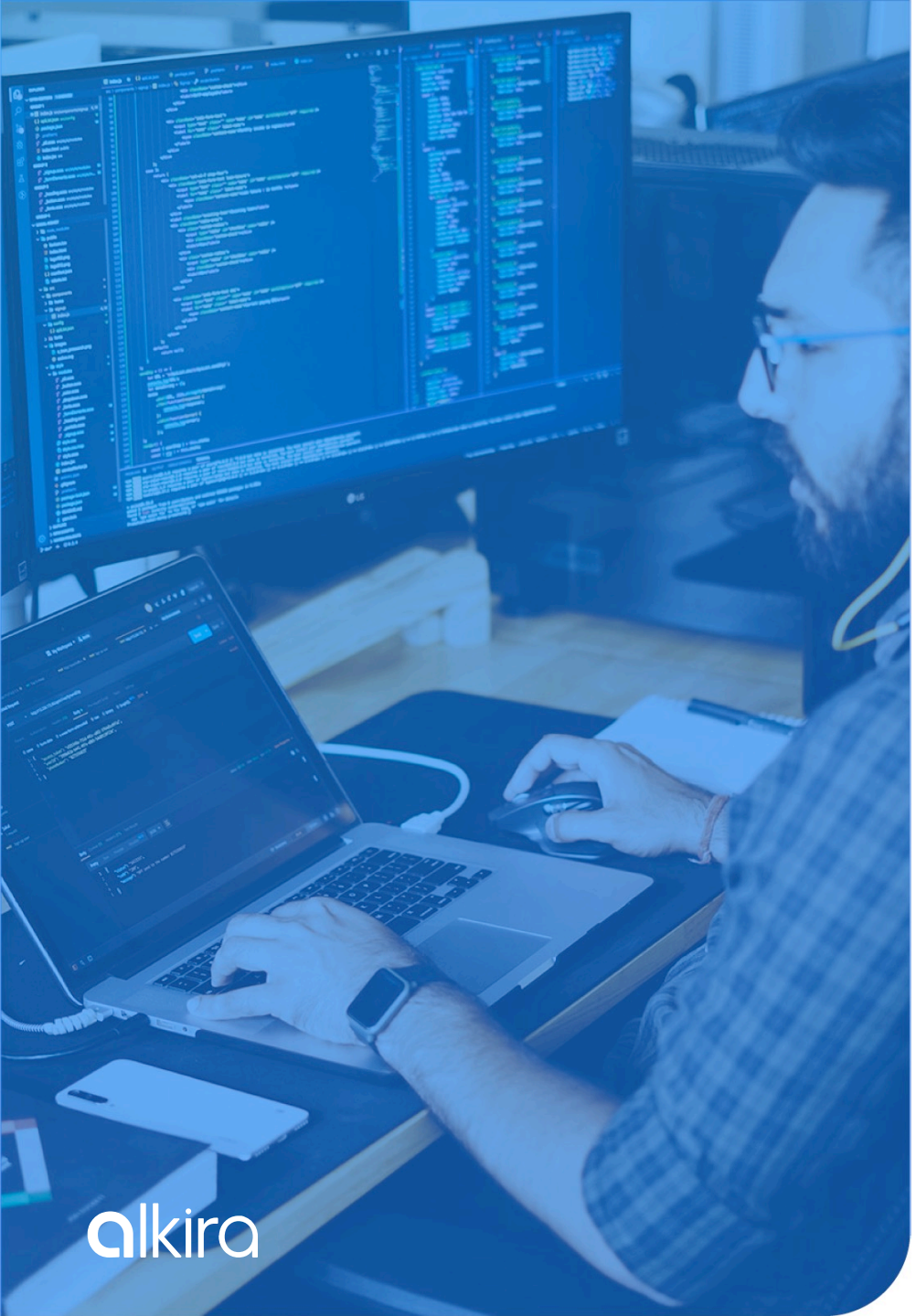


Build-Time



Driving With CI/CD





Shifting Gears For The ***Network***

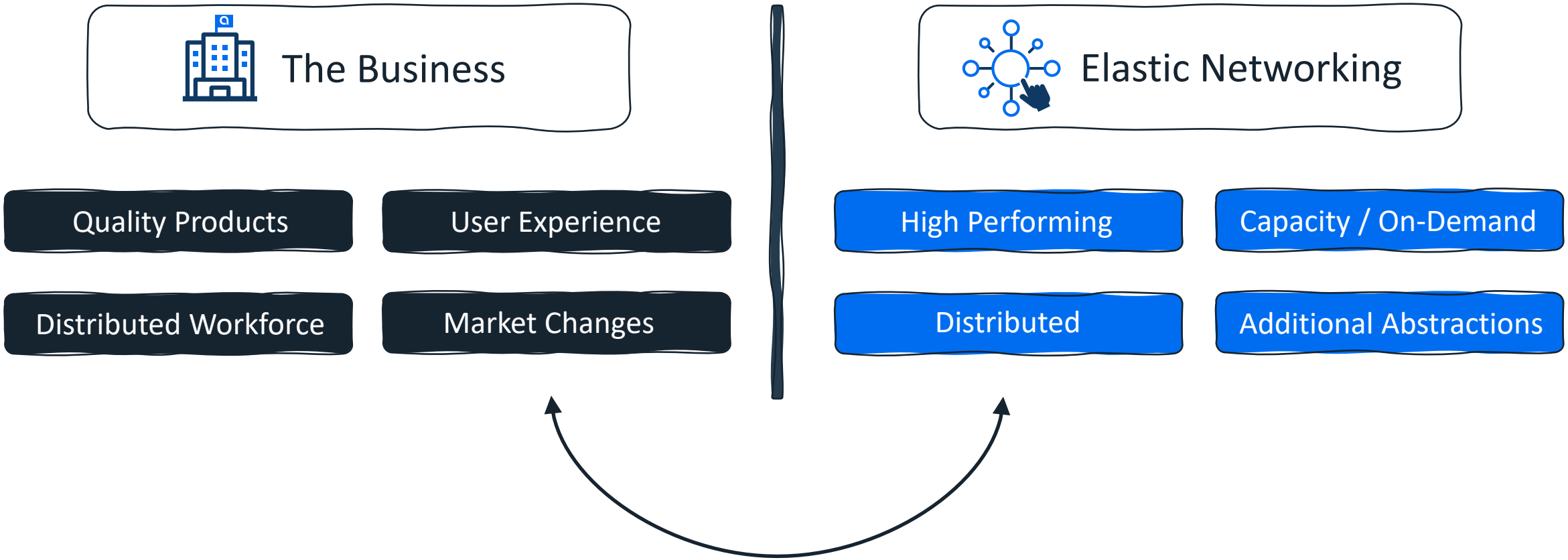
Simplicity is the ultimate sophistication

- Leonardo da Vinci

Elasticity For The Network

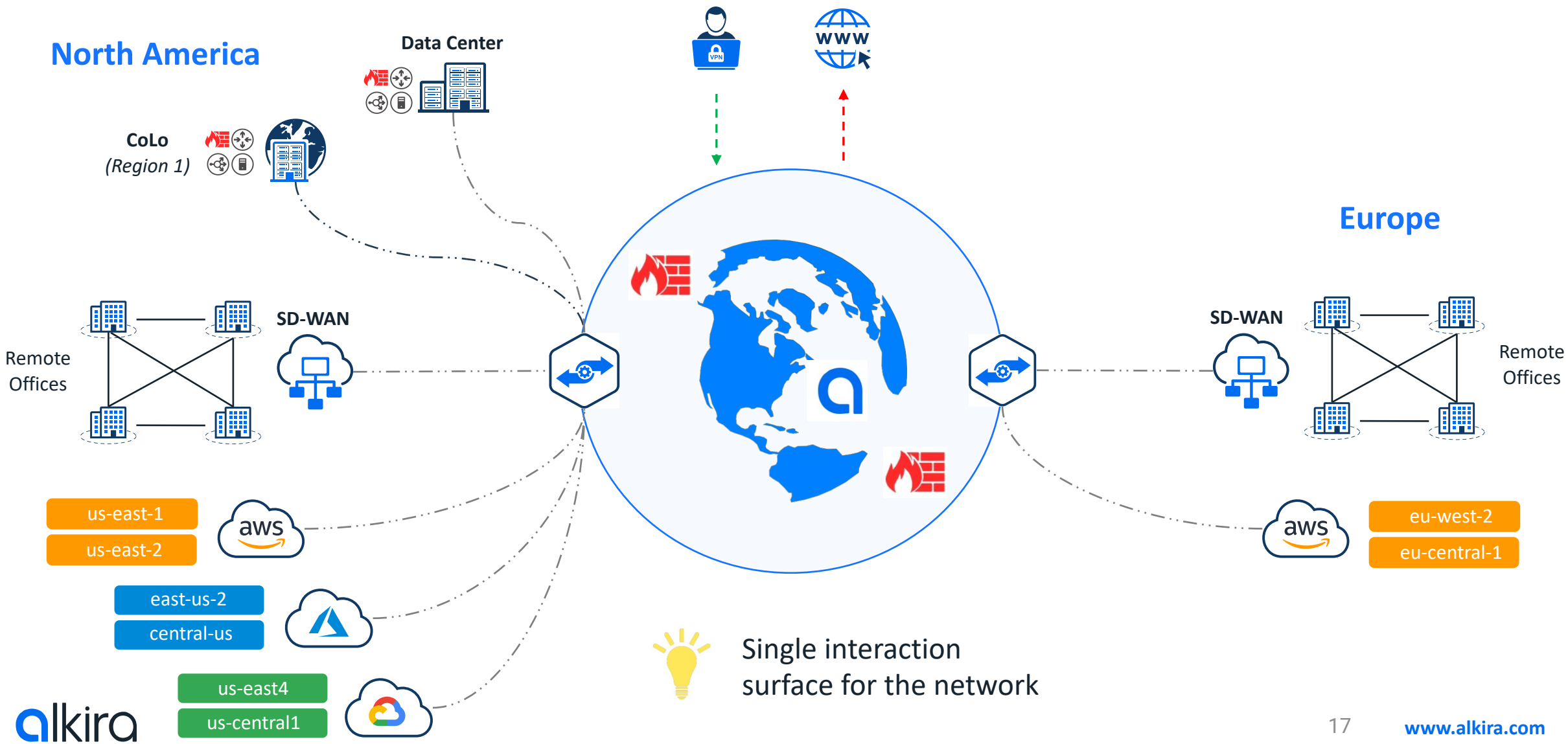
elastic : capable of being easily ***stretched*** or ***expanded*** and resuming former shape

(Webster)

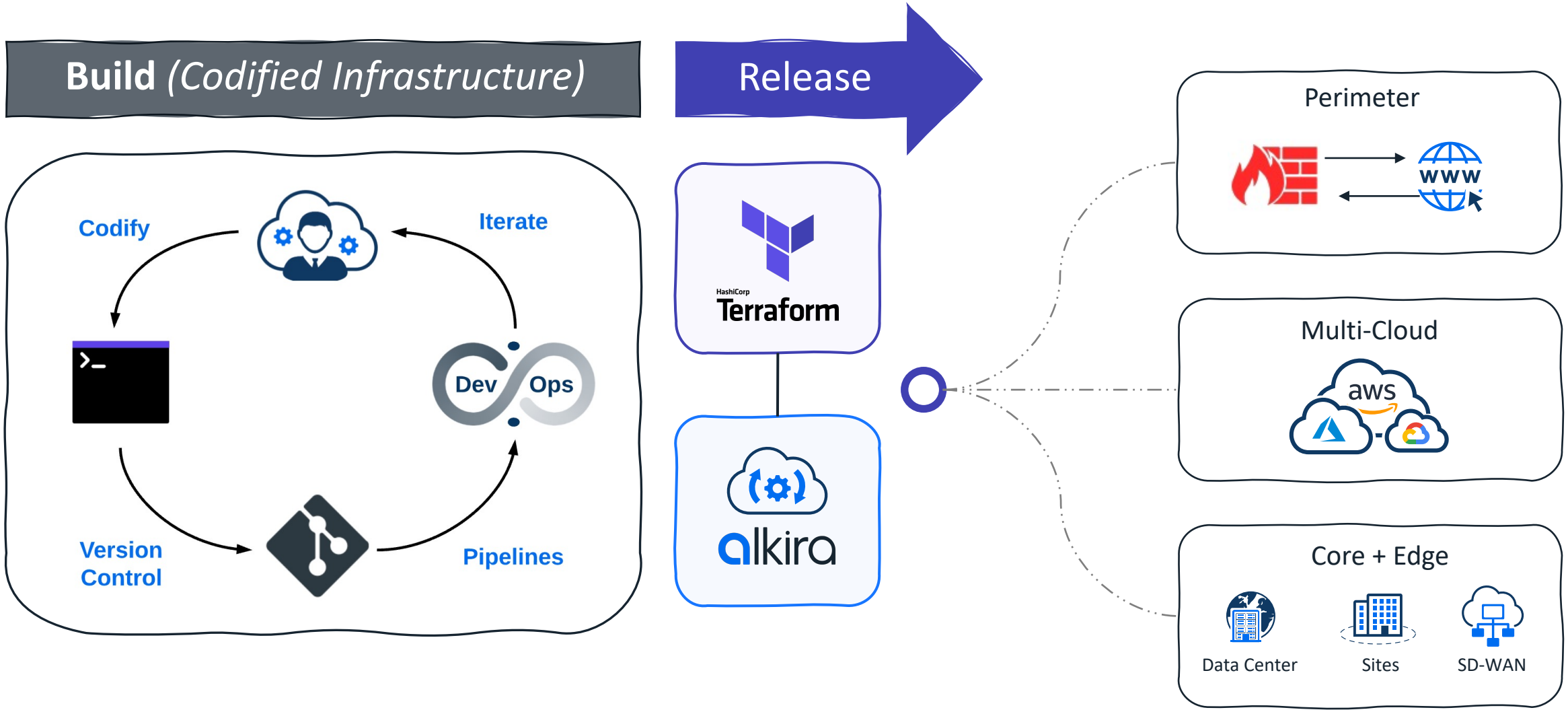


Critical link between networking and ***business outcomes***

Approaching Network as a Service



Integrating The Network



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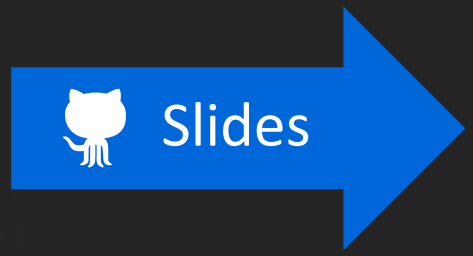

github.com/wcollins/driving-agile-networks-of-the-future

Thank You!