

Evolution of the Network Function

Yesterday, Today and Tomorrow

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The Promise of NFV

Automate the deployment and management of complex network services and put them in market faster and cheaper than before

The Journey to NFV

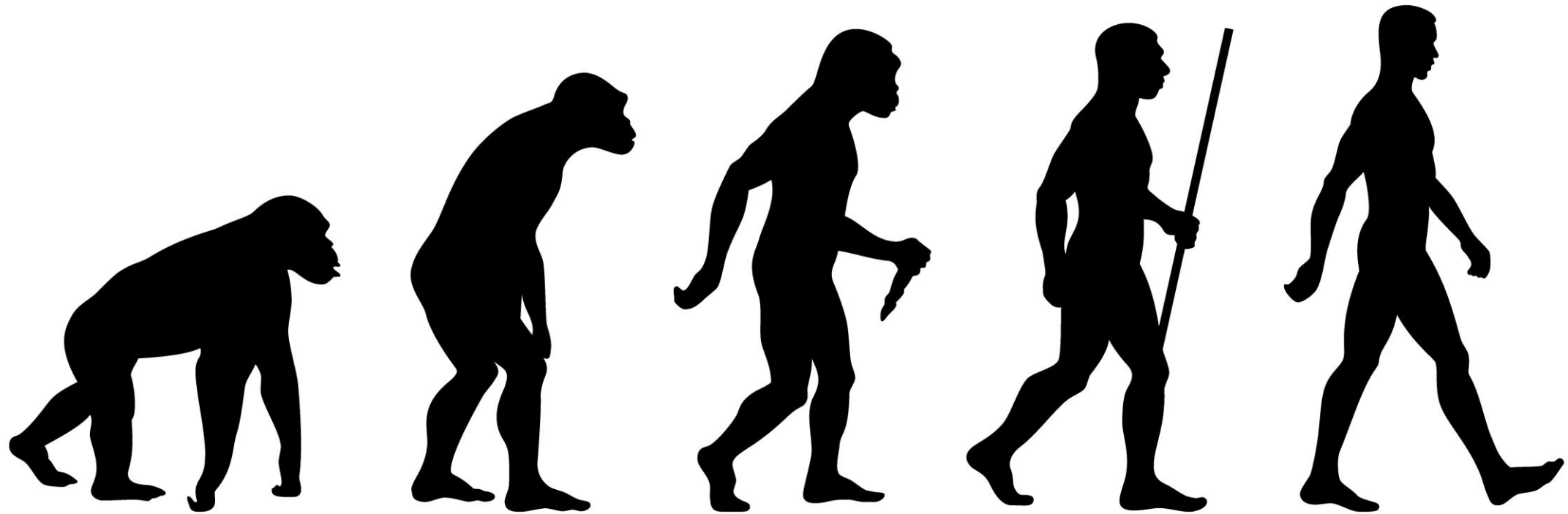
Has Been Bumpy So far



Deploying NFV based infrastructures has proven to be a more difficult ride than expected

Evolution of VNFs

Crawl Before We Walk



Evolution of VNFs



Physical



Virtualized



Cloud Friendly



Cloud Ready



Cloud Native

Evolution of VNFs

Appliance Based Devices

Deployment Format	Appliance
Architecture	Monolith
Upgrades	Manual - Disruptive
Scale out Methodology	Deploy larger hardware
Config Management	Manual - Distributed
Fault tolerance	None
Backup Methodology	Quiesce and image
Orchestration Onboarding	Proprietary



Physical

Evolution of VNFs

Physical to Virtual

Deployment Format	Virtual Machine
Architecture	Monolith
Upgrades	Manual -Disruptive
Scale out Methodology	Layer 4-7 Loadbalancer
Config Management	Manual - Distributed
Fault tolerance	None
Backup Methodology	Quiesce and image
Orchestration Onboarding	Complex/Customized



Virtualized

Evolution of VNFs

Getting Warmer

Deployment Format	Virtual Machine
Architecture	Scaled down VM
Upgrades	Manual - Non Disruptive
Scale out Methodology	Layer 4-7 Loadbalancer
Config Management	Manual - Distributed
Fault tolerance	Active Passive
Backup Methodology	Quiesce and image
Orchestration Onboarding	Simple/Customized



Cloud Friendly

Evolution of VNFs

Service Oriented Architectures

Deployment Format	Virtual Machine
Architecture	Service Oriented Arch
Upgrades	Manual - orchestrated
Scale out Methodology	SDN LB - sessionless
Config Management	Automated - (VNFM)
Fault tolerance	Active Clusters
Backup Methodology	N/A - templated
Orchestration Onboarding	Simple/Templated



Cloud Ready

Evolution of VNFs

The Ideal Solution

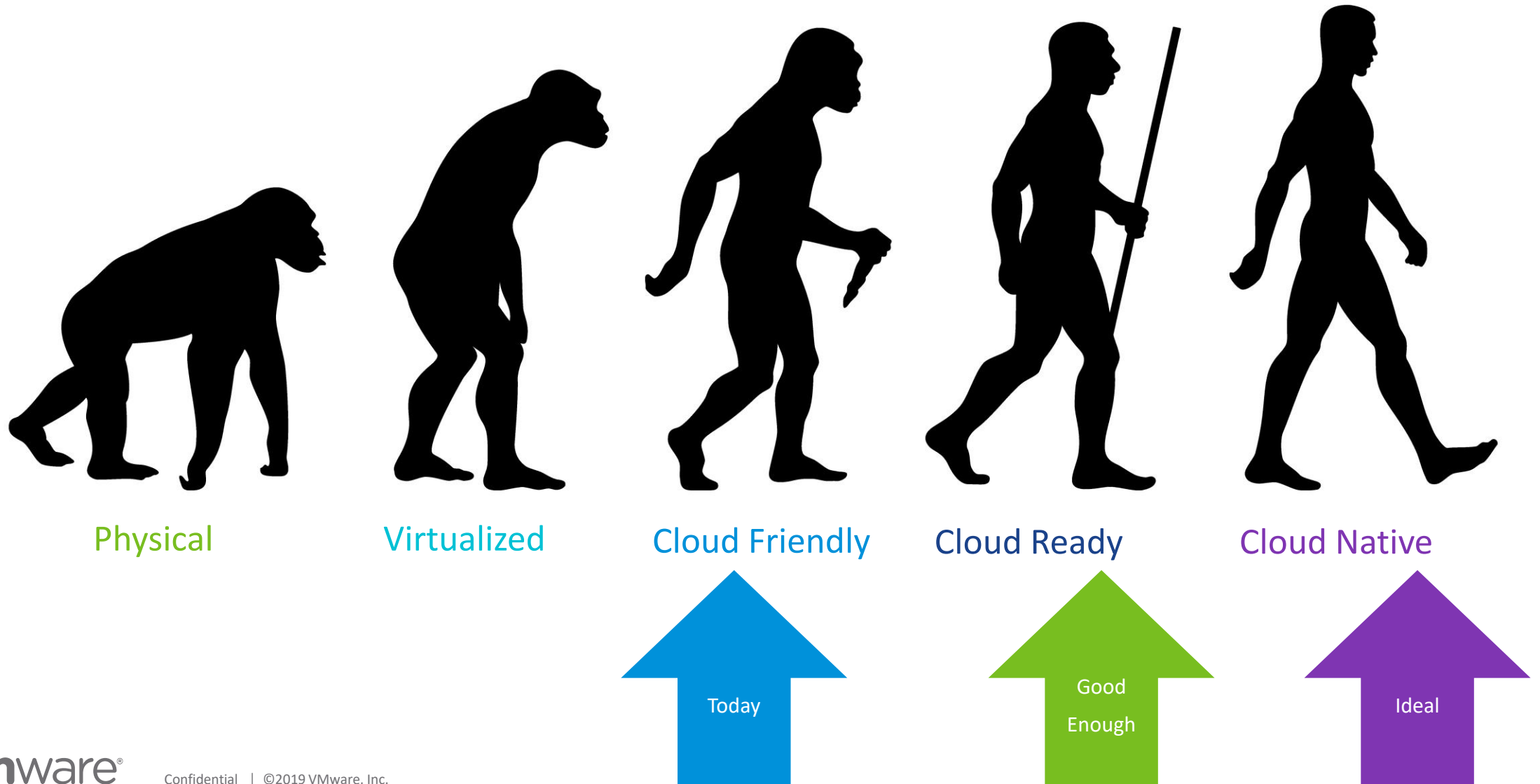
Deployment Format	Container
Architecture	Microservices
Upgrades	Automated
Scale out Methodology	Stateless - LB
Config Management	Automated - Centralized
Fault tolerance	Active Graph
Backup Methodology	N/A
Orchestration Onboarding	Simple/Templated



Cloud Native

Where are We Now

Are We Far Enough?



Moving in the Right Direction

Smoother Seas Ahead



As VNFs mature, Standards are ratified, Orchestrators become more feature rich...

the journey gets easier

Questions?