



LET'S TALK ABOUT CISCO TECHS

SDN, complexity and TCO: looking for an easy way

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ABOUT



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- Network and Security Architect (15+ years' exp.)
- Security Evangelist (Blue Team)
- Automation Addicted/Developer (UNetLab)
- Cisco CCIE #38620/VMware VCP/Red Hat RHCE



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COMPLEXITY



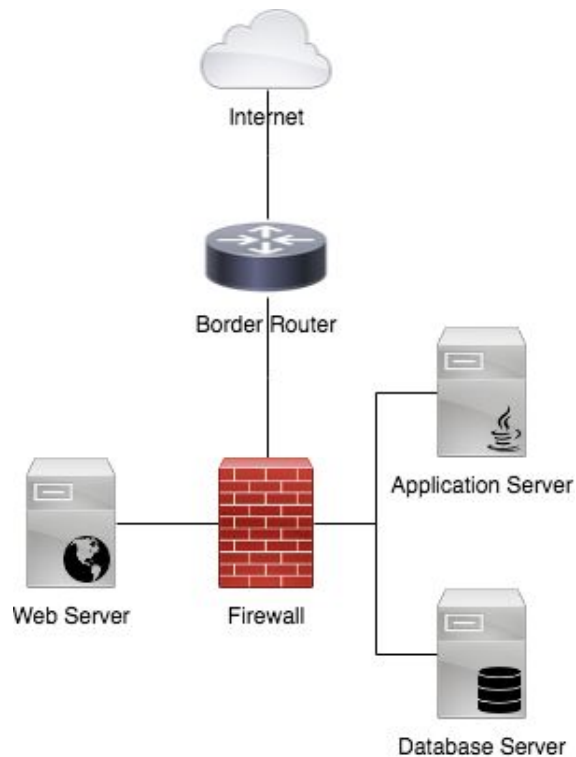
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Legacy Data Center (Yesterday)

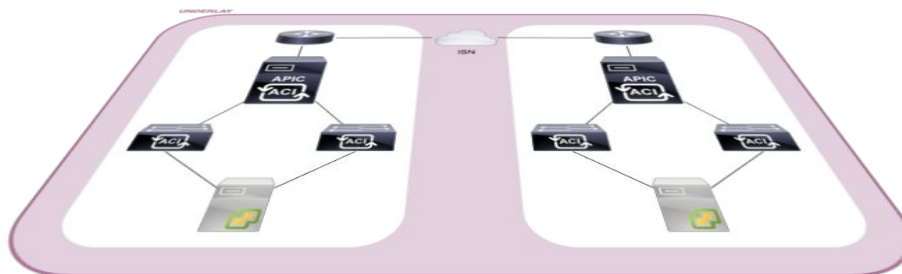
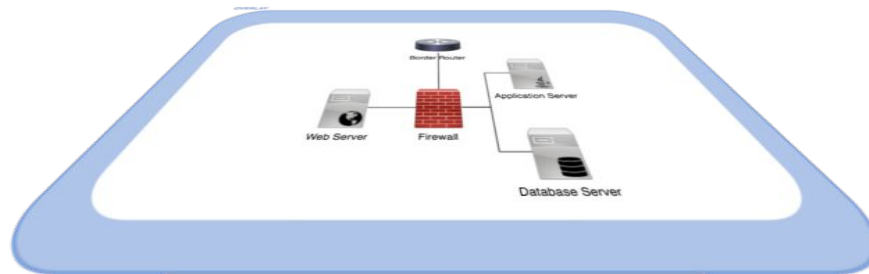


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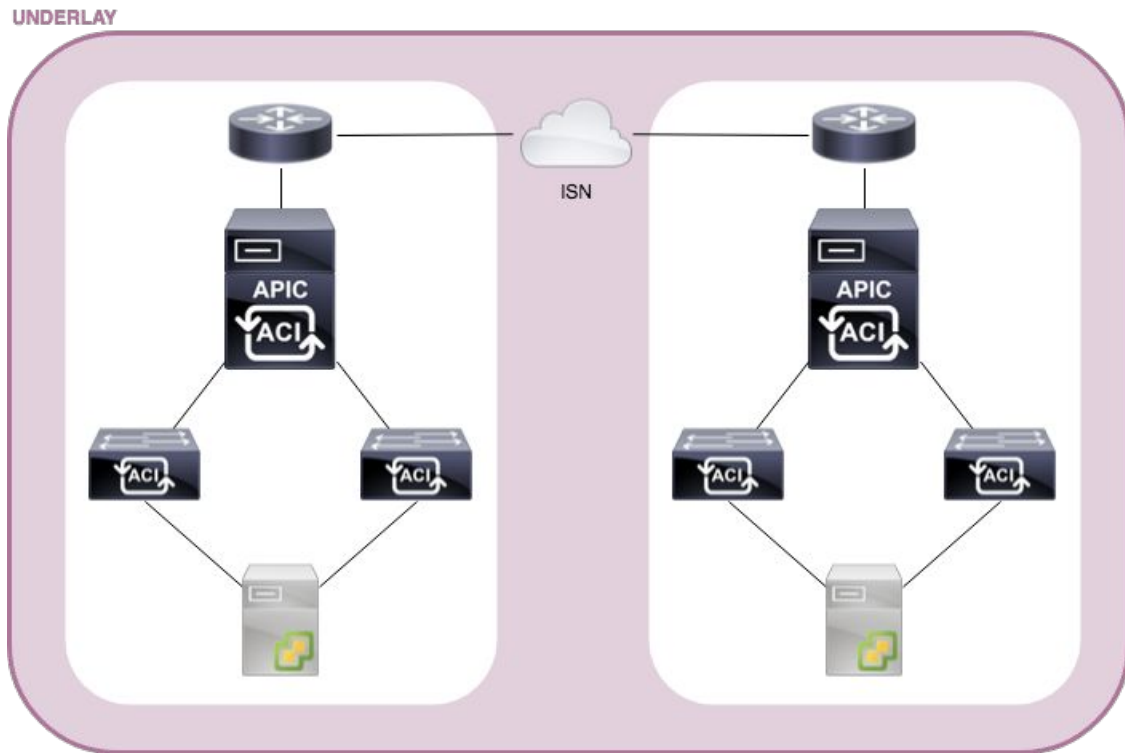
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New Generation Data Center



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New Generation Data Center (Underlay)



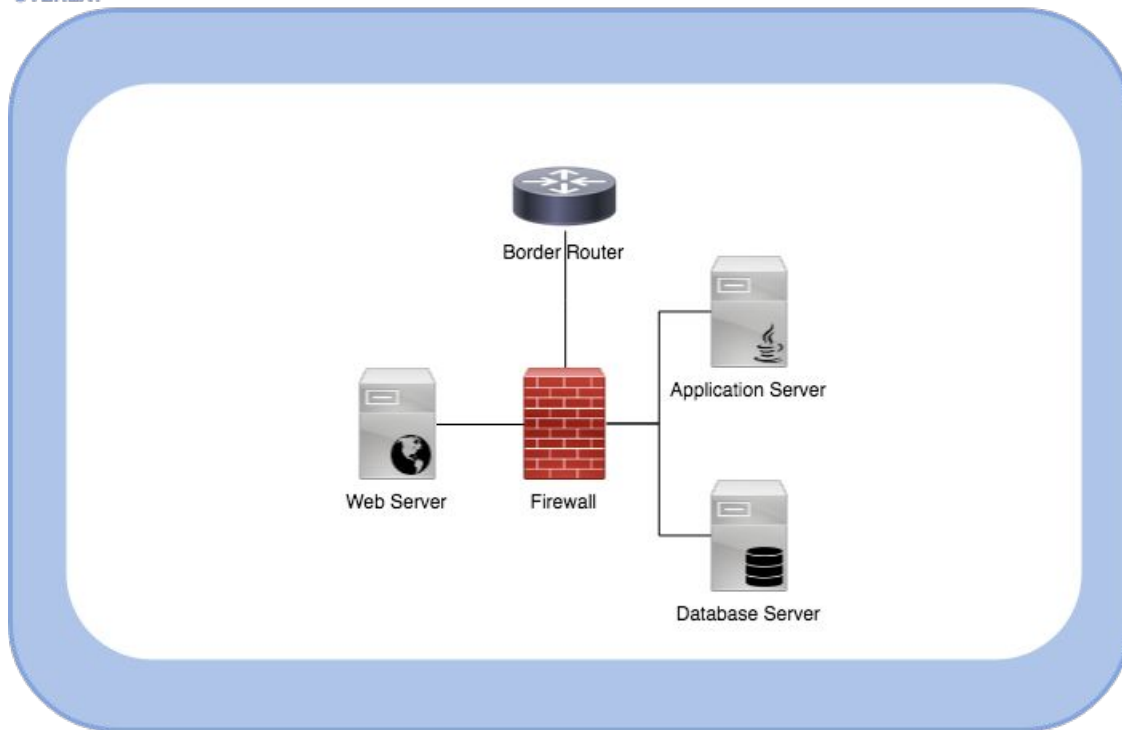
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New Generation Data Center (Overlay)

OVERLAY



HOW DO WE GET TO THIS?



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Characteristics of Legacy Applications

- Designed “to work” not “to scale”
- Low Latency between components
- Installed on (hopefully) lossless network
- L2 adjacency for clustered components
- Sometimes relies on single components

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Today's Requirements

- Security:
 - Intra application (secure the application itself)
 - Inter applications (avoid lateral movement)
- Scalability
- High Availability:
 - Local
 - Geographic
- Disaster Recovery

Application's Constraints

- Source code not available
- Documentation not available
- Original developers not available
- Based on legacy and non-upgradeable frameworks

False Application's Constraints

- Too complex to change
- Too expensive to change

Remapping Today's Requirements

- Security:
 - Intra application ➤ Web Application Firewall
 - Inter applications ➤ Microsegmentation
- Scalability ➤ Load Balancers*
- High Availability:
 - Local ➤ Hypervisor HA and VMware FT
 - Geographic ➤ GSLB*
- Disaster Recovery ➤ Replicators with orchestrator

* Sometimes application cannot support load balancers

WE'RE SOLVING APPLICATION LIMITS IN OTHER LAYERS



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The Twelve Networking Truths (RFC1925)

“(6) It is easier to move a problem around (for example, by moving the problem to a different part of the overall network architecture) than it is to solve it.

(6a) (corollary). It is always possible to add another level of indirection.”

Complexity is like entropy: moving a problem around, increase overall complexity.

**WE'RE INCREASING
OVERALL COMPLEXITY
AND COST**



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Proposed Solutions

- A. Design scalable applications
- B. ~~L2 Extensions~~
- C. Stretched Data Centers

CISCO ACI



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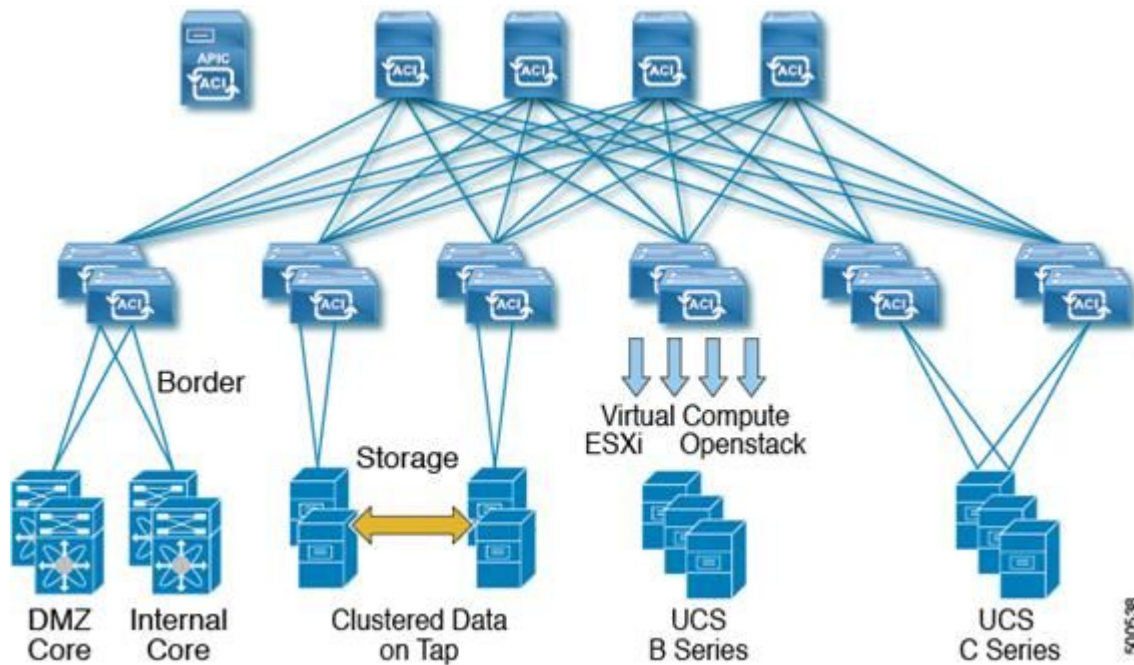
What is Cisco ACI?

- A scalable IP fabric
- A huge firewall
- A multi tenant platform
- An automatable network infrastructure
- A stretchable data center
- A data center ecosystem
- A single management point for the data center
- A SDN solution
- ...

Limits

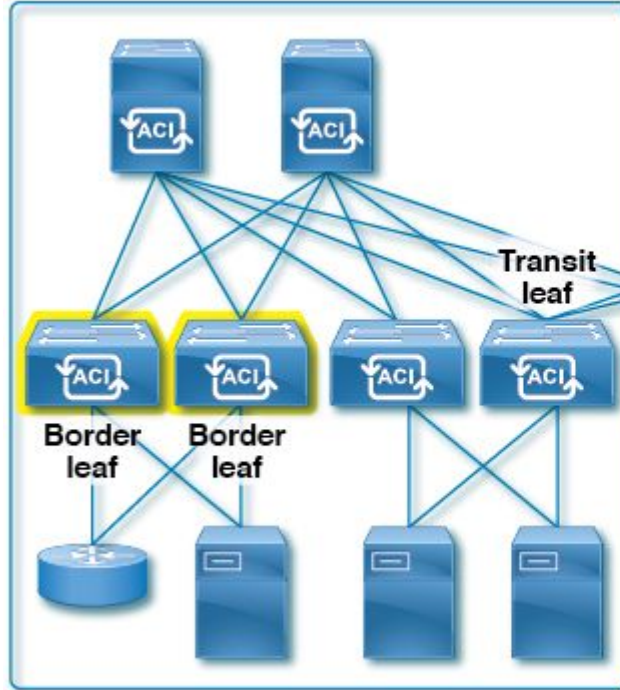
- up to 200 leaf switches
 - up to 24 spine switches (max 6 per POD)
 - up to 3000 tenants
 - up to 3000 VRFs
 - up to 15000 BDs
-
- up to 10ms RTT for stretched fabric
 - up to 50ms RTT for multi-POD
 - up to 300ms RTT for remote leaf
 - up to 1s RTT for multi-site

Topologies: Fabric

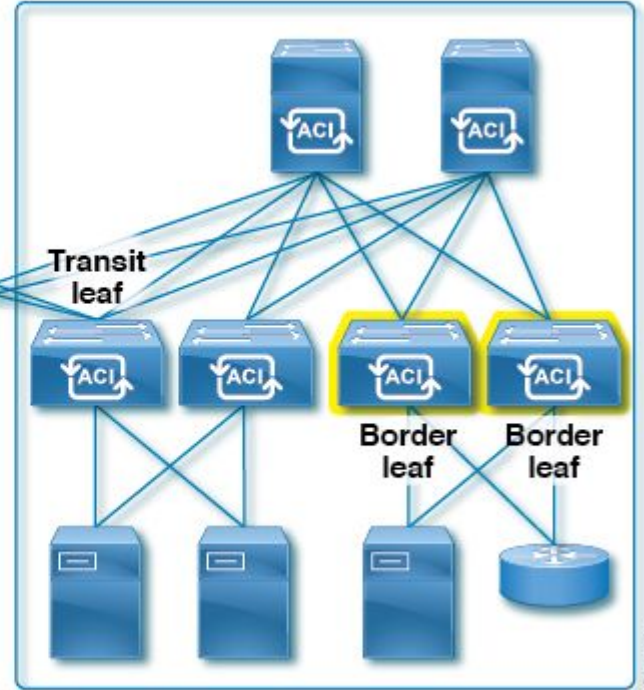


Topologies: Stretched Fabric

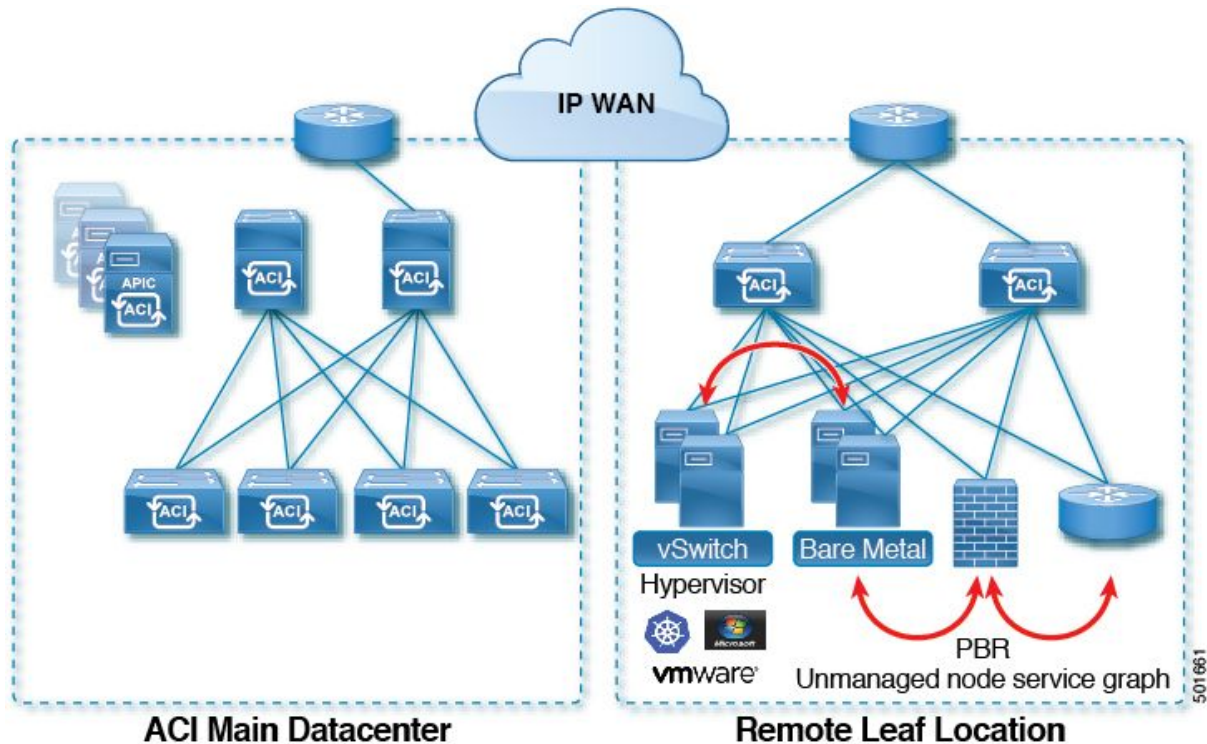
DC Site 1



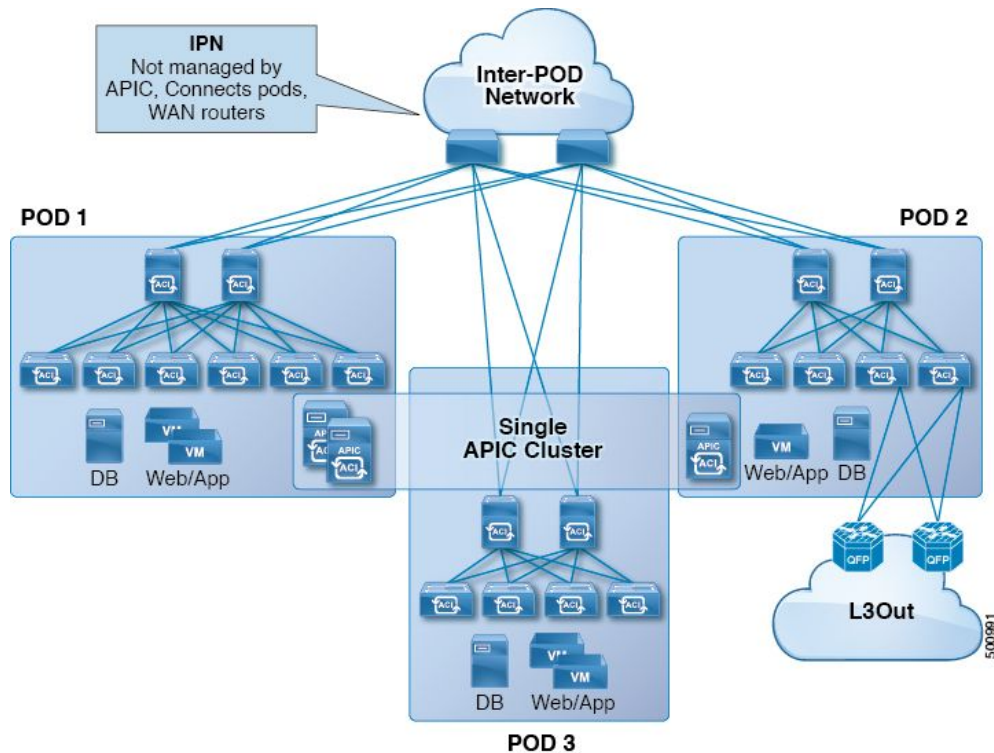
DC Site 2



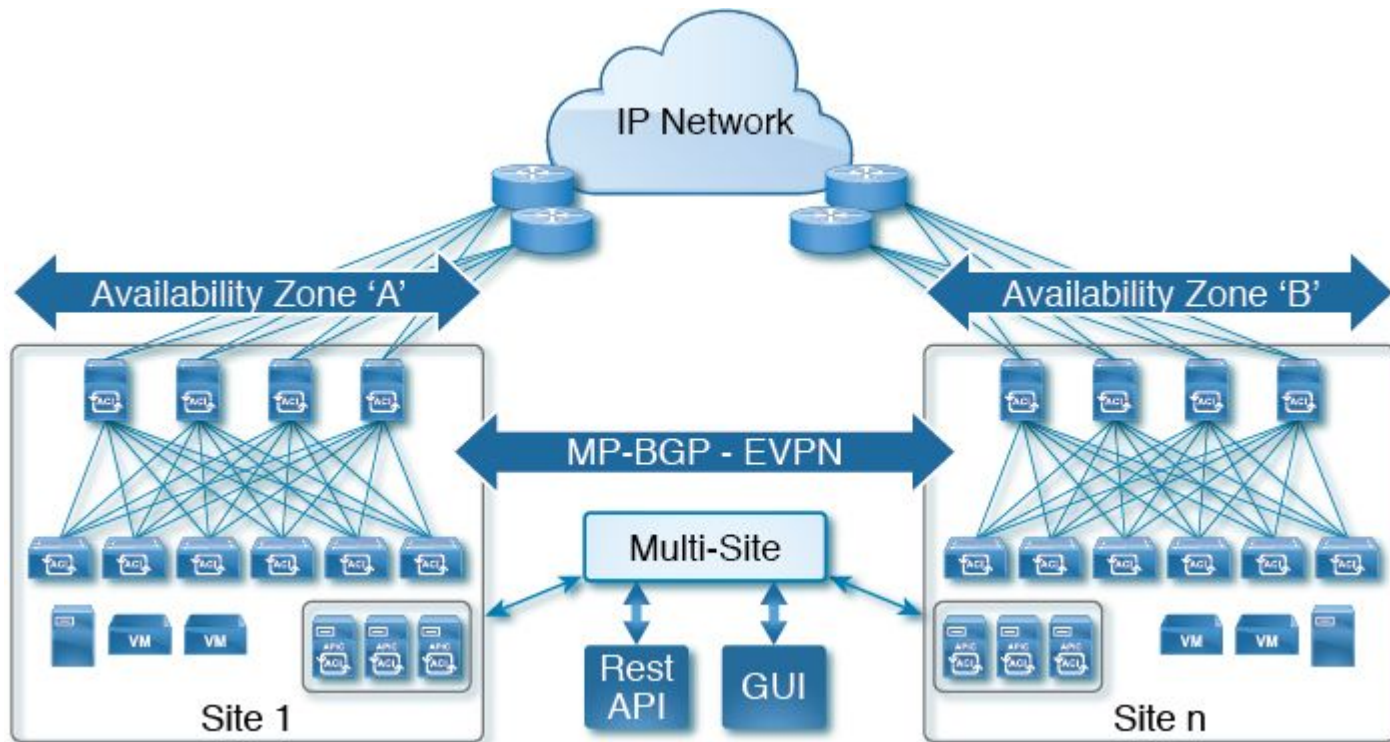
Topologies: Remote Leaf



Topologies: Multi POD



Topologies: Multi Site

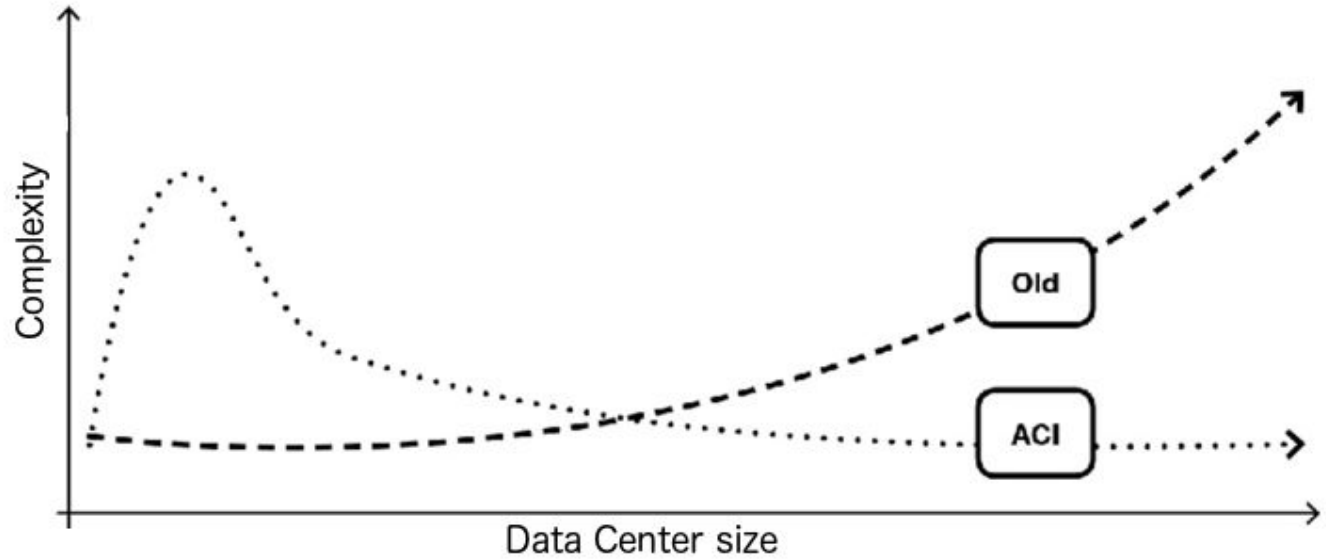


NETWORKERS TODAY



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Scalability VS Complexity



Less but more complex Data Centers

Piano di razionalizzazione delle risorse ICT (AGID)

- SPC Cloud
- Poli strategici nazionali
- Infrastrutture Gruppo A ➤ “non potranno essere effettuati investimenti”
- Infrastrutture Gruppo B ➤ “dovranno essere rapidamente consolidate”

https://pianotriennale-ict.readthedocs.io/it/latest/doc/03_infrastrutture-fisiche.html

Required Skills Today (real example)

- Strong understanding of Linux/UNIX systems
- Practical knowledge of shell scripting and programming.
- Deep experience with configuration management systems.
- Experience building and managing containerized applications.
- Familiarity with automating distributed infrastructure and cloud services.

QUESTIONS?

THANK YOU



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