WORKSHOP GARR 2021
NET MAKERS

# DC Network
# IP Fabric
# EVPN/VxLAN

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# Il Progetto, le necessità attuali e future

- Un singolo DC da aggiornare

- 8 RACK per Calcolo e Storage
  - Circa 60 host fisici con interfacce 10/25/100G
  - Circa 350 VM

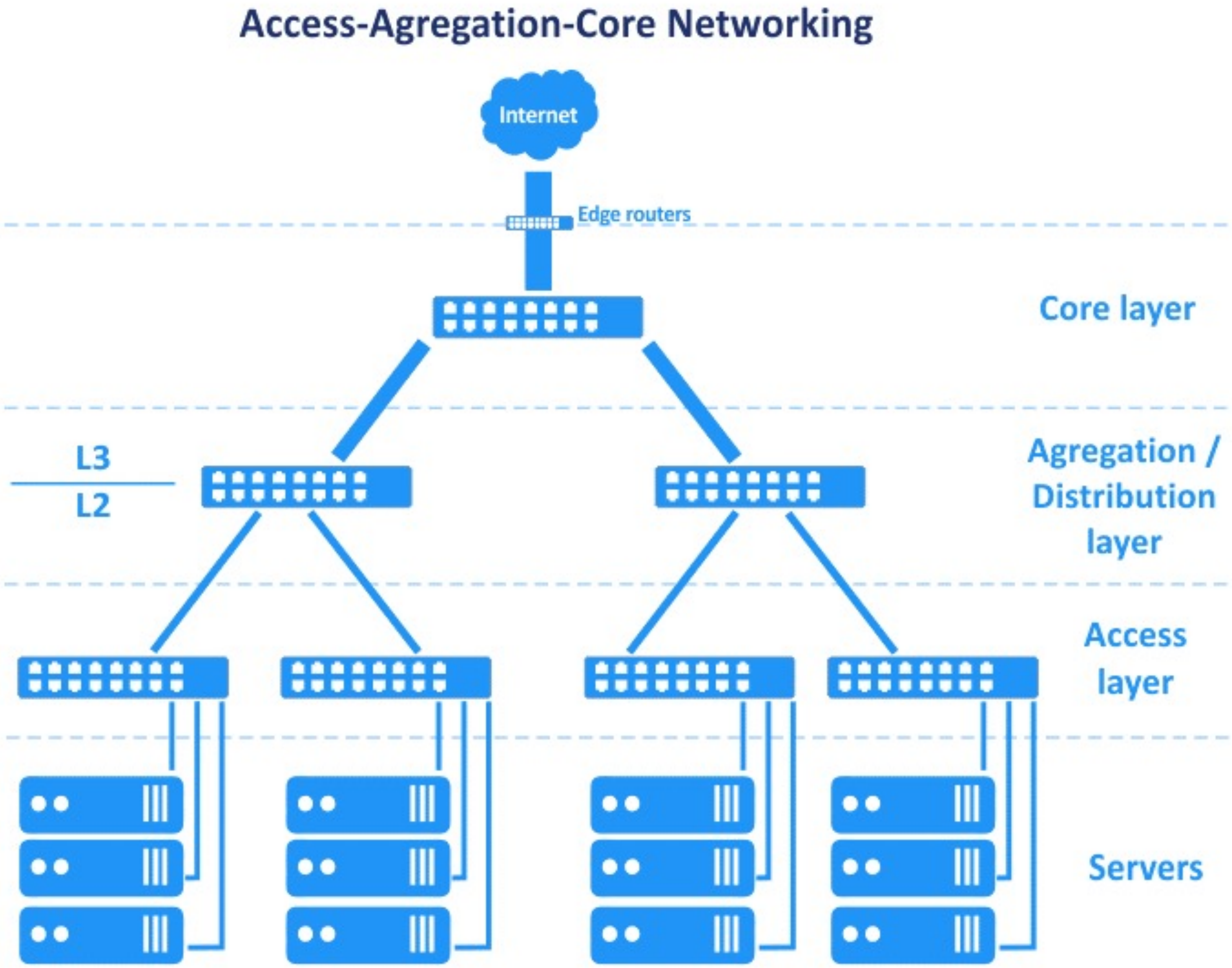
- 9 Padiglioni da interconnettere al DC
  - Circa 20 Switch L2 PoE

- Migrare tutto (quasi) senza interruzione di servizio

# Il Data Center “ieri”

- Classica topologia 3-TIER basata su tecnologia Cisco
- Uplink a 10G e interfacce di accesso a 1/10G
- Routing Centralizzato, tutto il traffico viene trasportato in L2
- STP presente ☹

# Il Data Center “ieri”

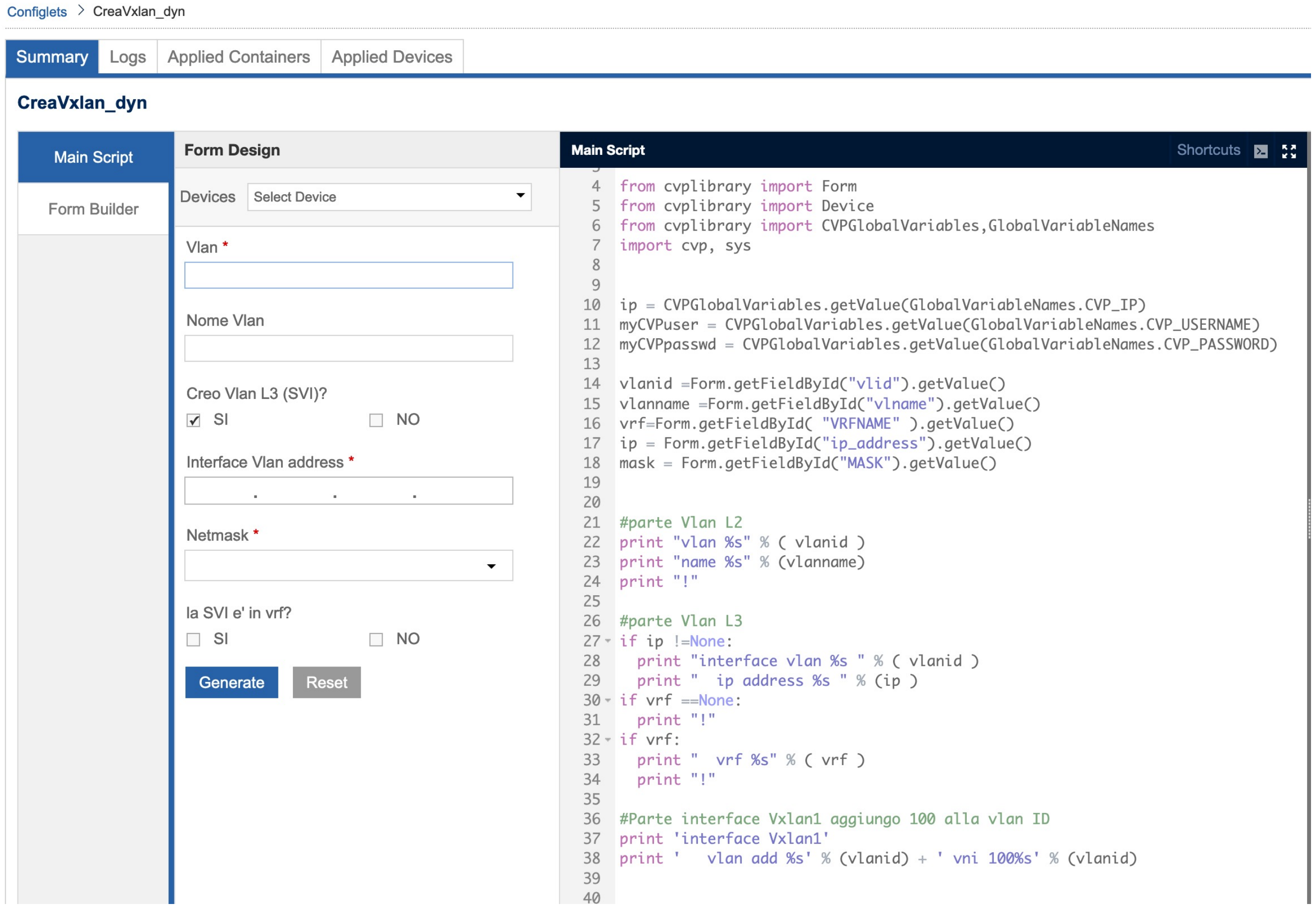


# Cambio di mentalità e di approccio

- Da esperti di networking a sistemisti/programmatori
- Workload orchestration and work flow automation (Arista Cloud Vision)
- Scordarsi la Command Line Interface (CLI)
- Monitoraggio e telemetria

# Workload orchestration and work flow automation

- Arista Cloud Vision



# Workload orchestration and work flow automation

- Arista Cloud Vision

Network Provisioning

- Tenant (16)
  - Undefined (1)
  - Imaa-CNR (16)
    - CAMPUS (2)
    - LEAF (12)
    - ROUTER_WAN (0)
    - SPINE (2)

| Name | IP Address | Mac Address | Serial No. | Container | Status |
|---|---|---|---|---|---|
| leaf-ced1-dw.ced.imaa.cnr.it | 10.0.70.23 | d4:af:f7:44:8e:a3 | JPE20340800 | LEAF | |
| leaf-ced1-up.ced.imaa.cnr.it | 10.0.70.22 | d4:af:f7:44:97:ed | JPE20351833 | LEAF | |
| leaf-sat1-dw.ced.imaa.cnr.it | 10.0.70.25 | d4:af:f7:91:7c:ab | JPE20362197 | LEAF | |
| leaf-sat1-up.ced.imaa.cnr.it | 10.0.70.24 | d4:af:f7:90:d4:81 | JPE20362240 | LEAF | |
| sw-actris1-dw.ced.imaa.cnr.it | 10.0.70.21 | d4:af:f7:90:cf:0f | JPE20351805 | LEAF | |
| sw-actris1-up.ced.imaa.cnr.it | 10.0.70.20 | d4:af:f7:91:2b:f3 | JPE20361929 | LEAF | |
| sw-actris2-dw.ced.imaa.cnr.it | 10.0.70.19 | d4:af:f7:90:d3:dd | JPE20361834 | LEAF | |
| sw-actris2-up.ced.imaa.cnr.it | 10.0.70.18 | d4:af:f7:91:74:a9 | JPE20372367 | LEAF | |
| sw-campus-ced-dw.ced.imaa.cnr.it | 10.0.70.33 | fc:bd:67:83:7a:eb | JPE19364267 | CAMPUS | |
| sw-campus-ced-up.ced.imaa.cnr.it | 10.0.70.32 | fc:bd:67:83:5c:73 | JPE19313760 | CAMPUS | |
| sw-leaf-access-dw.ced.imaa.cnr.it | 10.0.70.15 | d4:af:f7:91:2d:8d | JPE20362276 | LEAF | |
| sw-leaf-access-up.ced.imaa.cnr.it | 10.0.70.14 | d4:af:f7:44:52:bd | JPE20351786 | LEAF | |
| sw-leaf-campus-dw.ced.imaa.cnr.it | 10.0.70.13 | d4:af:f7:44:7f:e7 | JPE20351927 | LEAF | |
| sw-leaf-campus-up.ced.imaa.cnr.it | 10.0.70.12 | d4:af:f7:90:d4:2f | JPE20362298 | LEAF | |
| sw-spine-dw.ced.imaa.cnr.it | 10.0.70.11 | d4:af:f7:4c:f7:05 | JPW20280968 | SPINE | |
| sw-spine-up.ced.imaa.cnr.it | 10.0.70.10 | d4:af:f7:4d:0e:39 | JPW20280867 | SPINE | |

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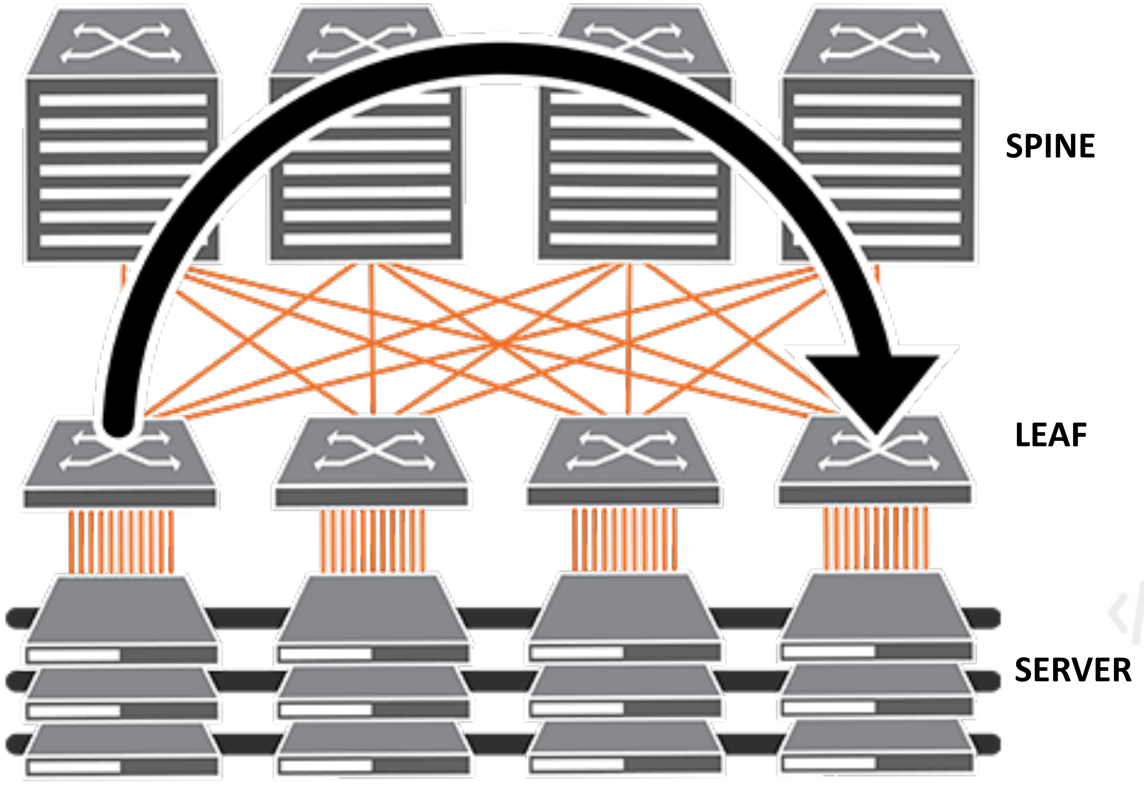
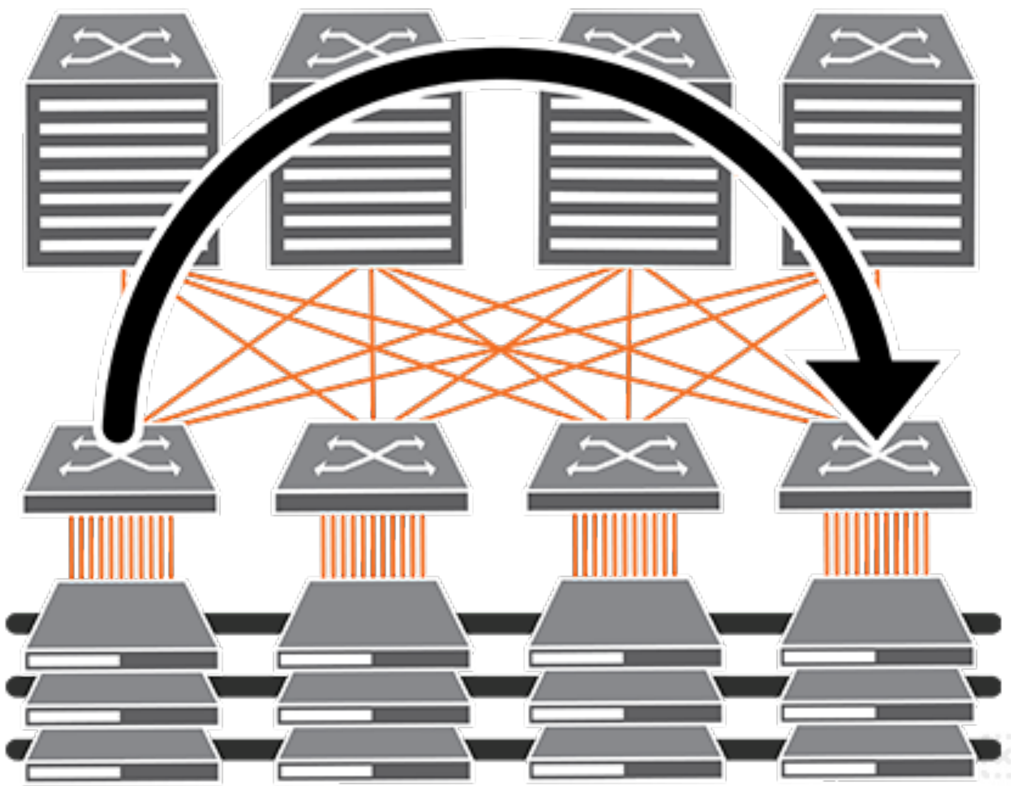
# Il Data Center "oggi"

- CLOS SPINE/LEAF Arista Networks
  Oversubscription ratio (3:1)
- Uplink a 100G e Interfacce di accesso a 10/25/100G
- Underlay IP Fabric (BGP)
- Overlay Control Plane EVPN IRB
  (intra-subnet L2 e inter-subnet L3)
- Overlay Data Plane VxLAN
  (Incapsula/decapsula i frame Ethernet Layer 2 in pacchetti UDP Layer 3 tramite i VTEP)

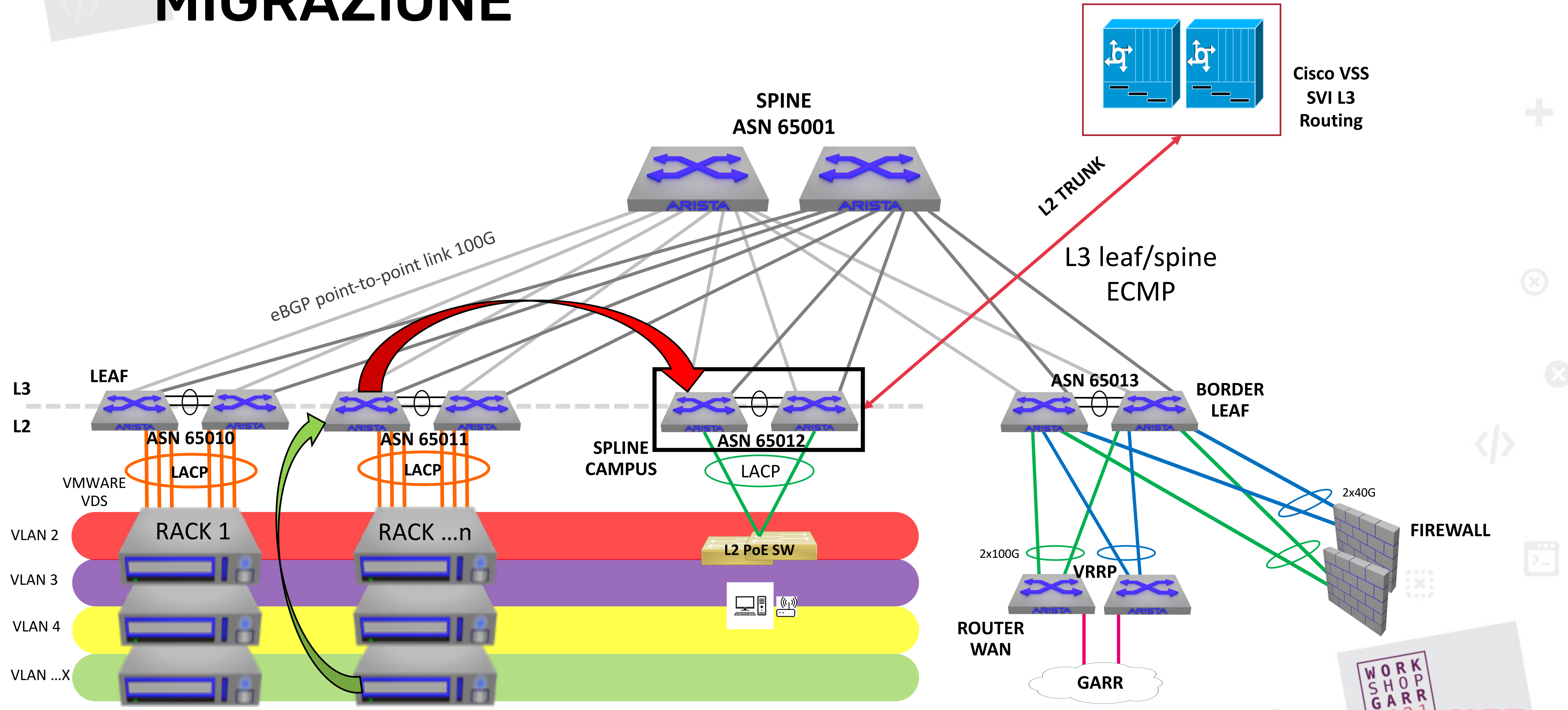


# Il Data Center “oggi”

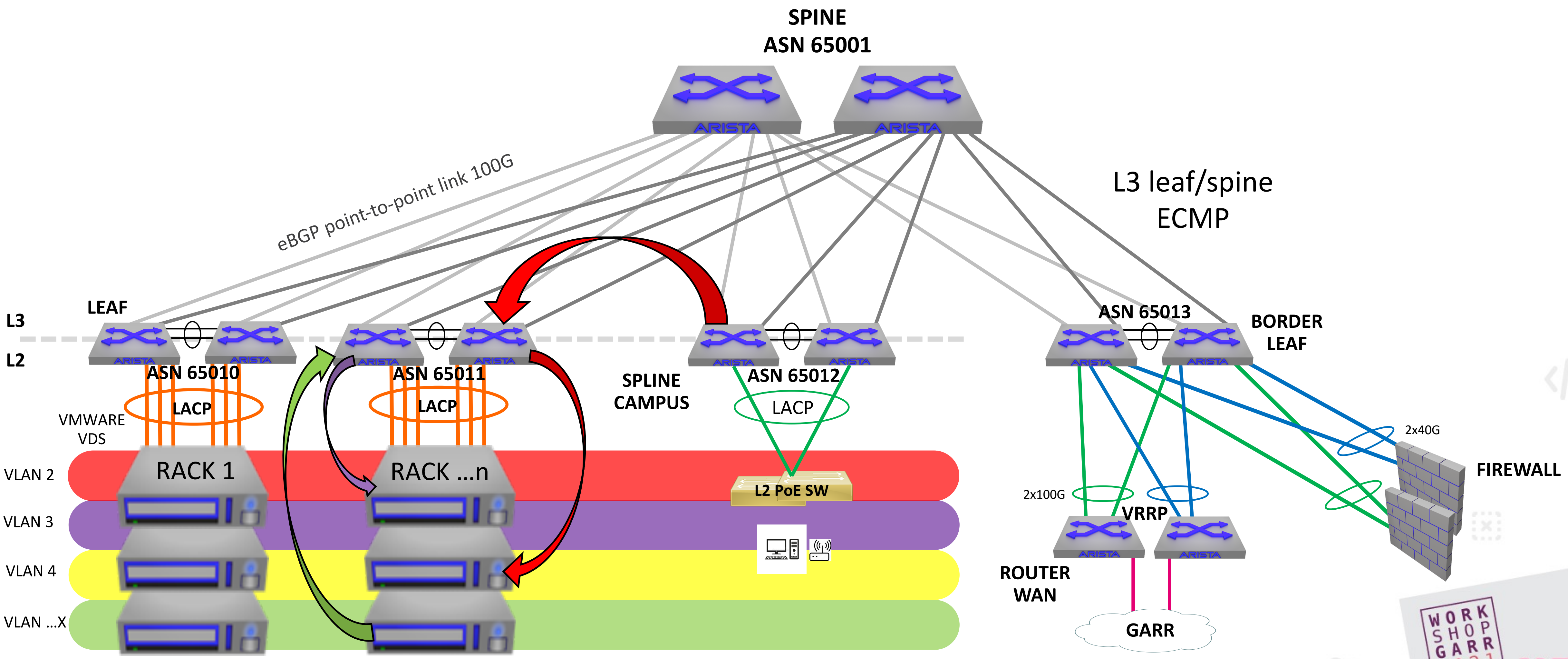
- NO STP ☺ - no blocking
- Da 4096 a oltre 16M VLAN
- Routing distribuito a livello dei LEAF
- Scalabilità e failover - L3 Fabric
- Flessibilità grazie al disaccoppiamentro tra la rete underlay fisica e la rete overlay virtuale



# Il Data Center "oggi": MIGRAZIONE



# Il Data Center “oggi”



# Implementazioni future

- ANSIBLE – Arista Cloud Vision
- MACROSEGMENTATION ARISTA-PALOALTO
- Trasporto VxLAN GEOGRAFICO verso una sede secondaria
- VxLAN verso il CAMPUS
- MIGLIORARE IL MONITORAGGIO

GRAZIE PER L'ATTENZIONE

Consiglio Nazionale delle Ricerche
Istituto di Metodologie per l'Analisi Ambientale

ACTRIS ITALIA