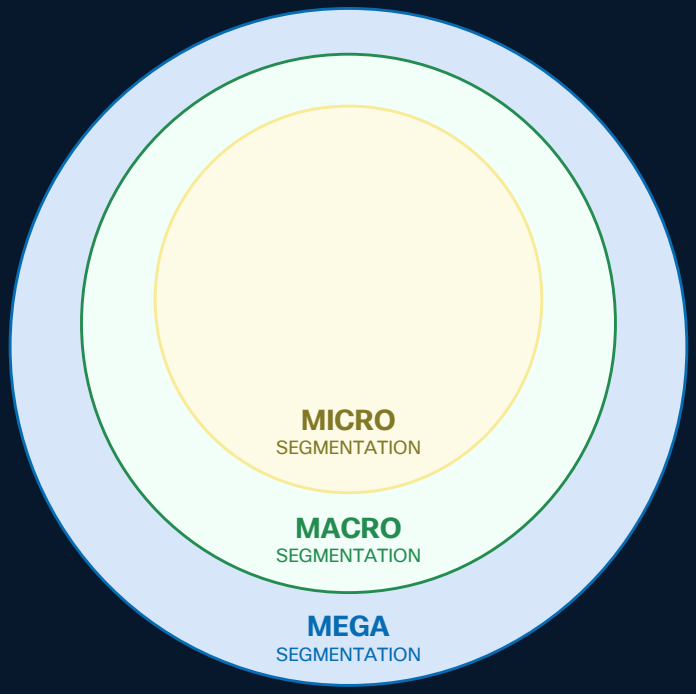
OD MAKRA K MIKRO, OD IP K IDENTITÁM: EVOLÚCIA SEGMENTÁCIE V CAMPUSOCH A DÁTOVÝCH CENTRÁCH V ÉRE ZERO TRUST

Tomáš Ondovčík

Network Segmentation Use cases



Network Segmentation Spectrum

Mega Segmentation (The Perimeter)
- Broadest level of isolation (inside / outside boundary).
- Focuses on North-South traffic (Internet vs. Enterprise) and major domain separation (e.g., Data Center vs. Campus).

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- Examples: Dev/Test/Prod, HR/Finance, EMEA/APAC).

Micro Segmentation (The Identity & Role)
- Granular isolation within a specific macro segment based on identity and function rather than IP addresses.
- Campus: Isolate users, devices, and IoT endpoints within the same VLAN (using Cisco TrustSec SGTs, VXLAN GPO)
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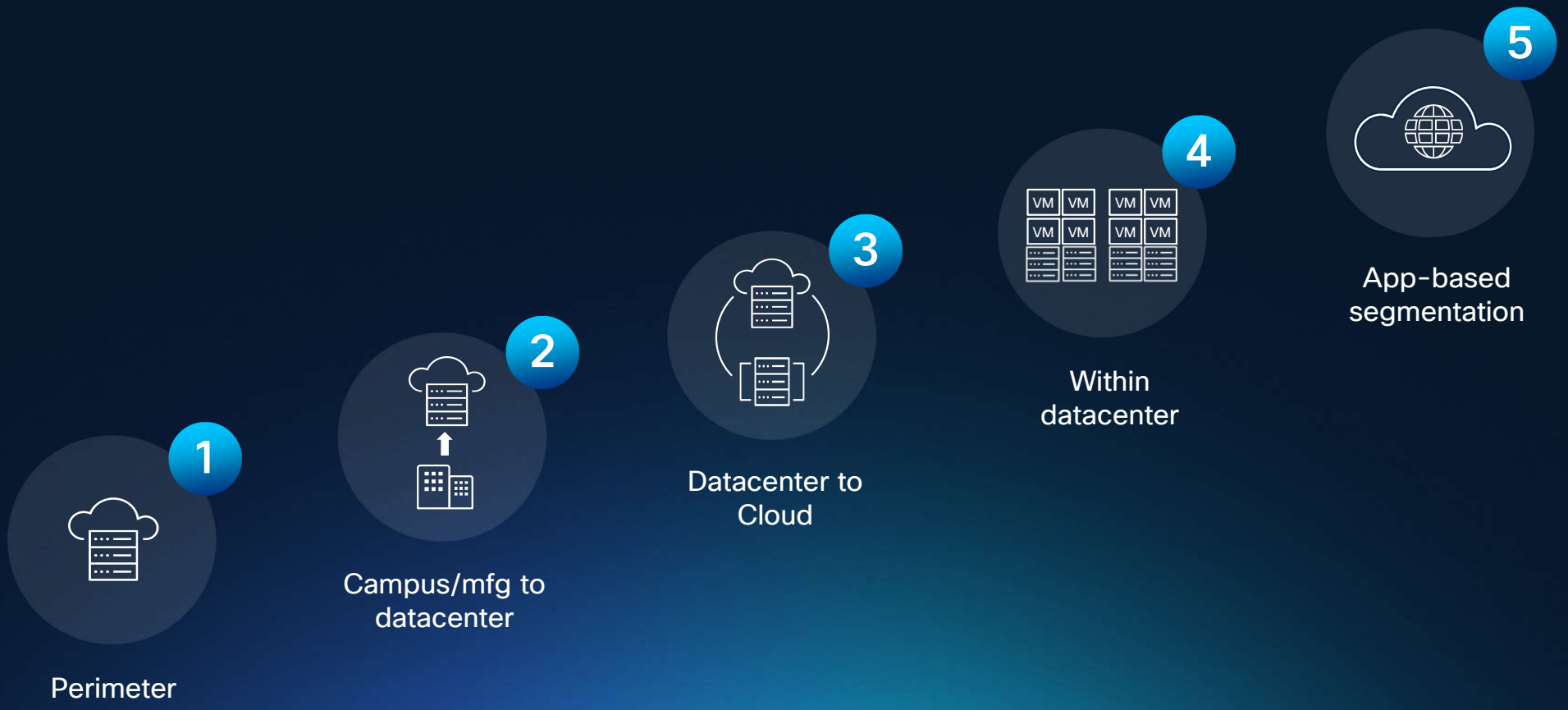
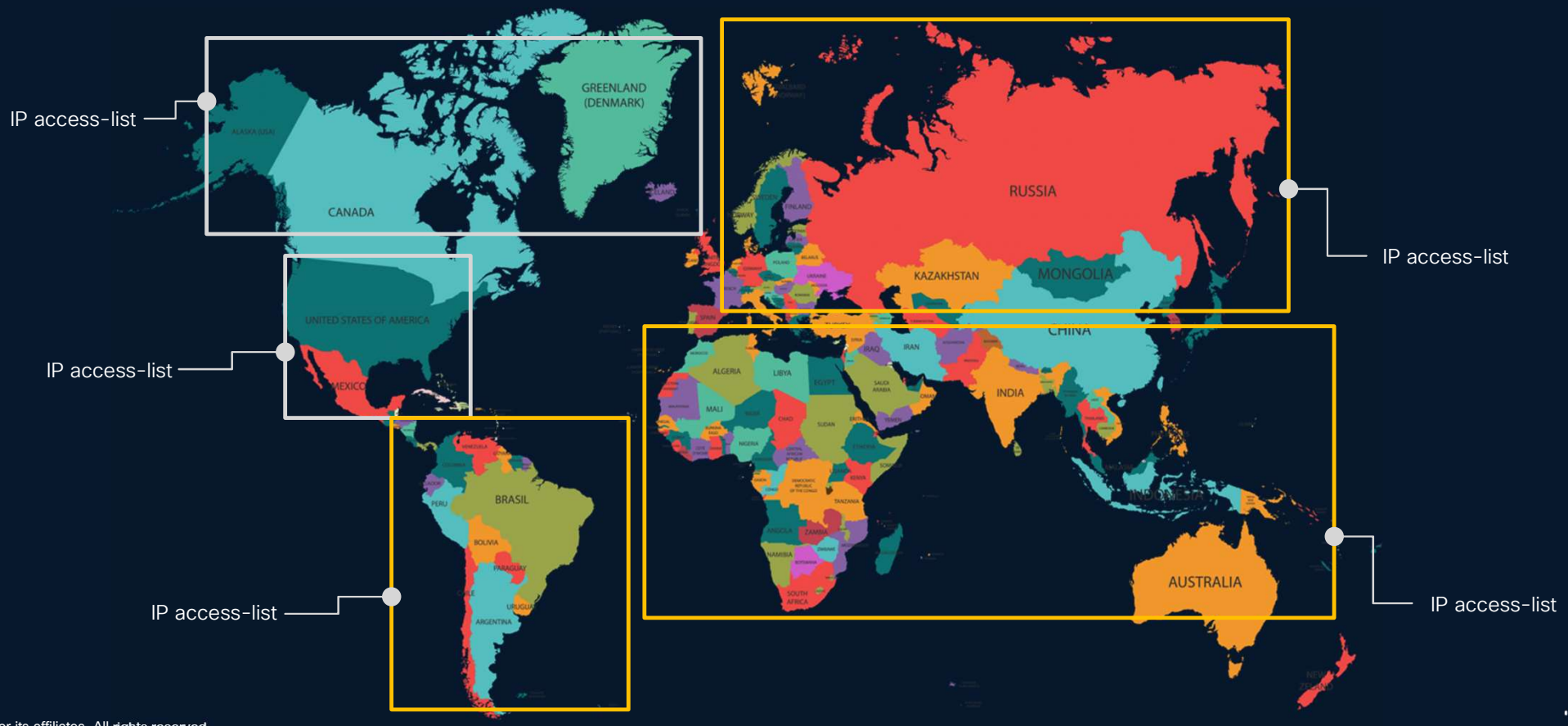
Segmentation that meets you where you are



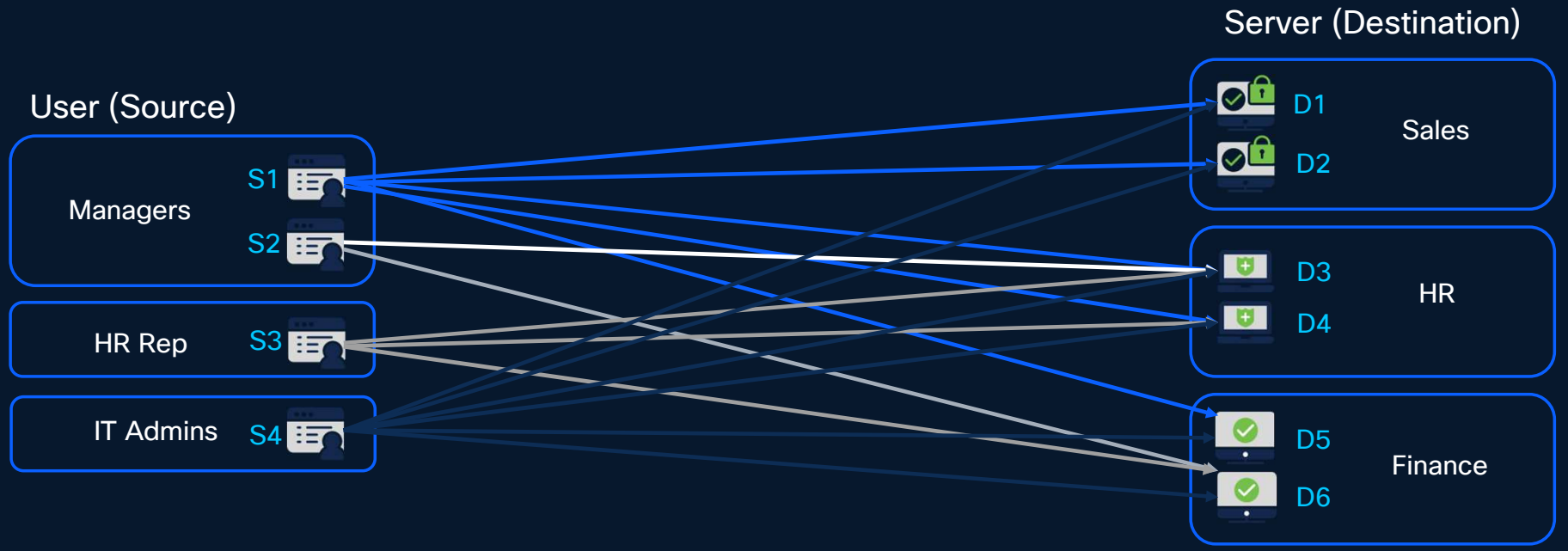
Campus

Traditional Segmentation



What is the issue?

Traditional Segmentation



Number of ACL's:

(# of Sources) * (# of Destinations) * Permissions = # of ACEs

Src (S1) * Dst (D1~D6) * Permission (4) = 24 ACEs for S1

Src (S1~S4) * Dst (D1~D6) * Permission (4) = 96 ACEs for S1~S4

What is the issue?

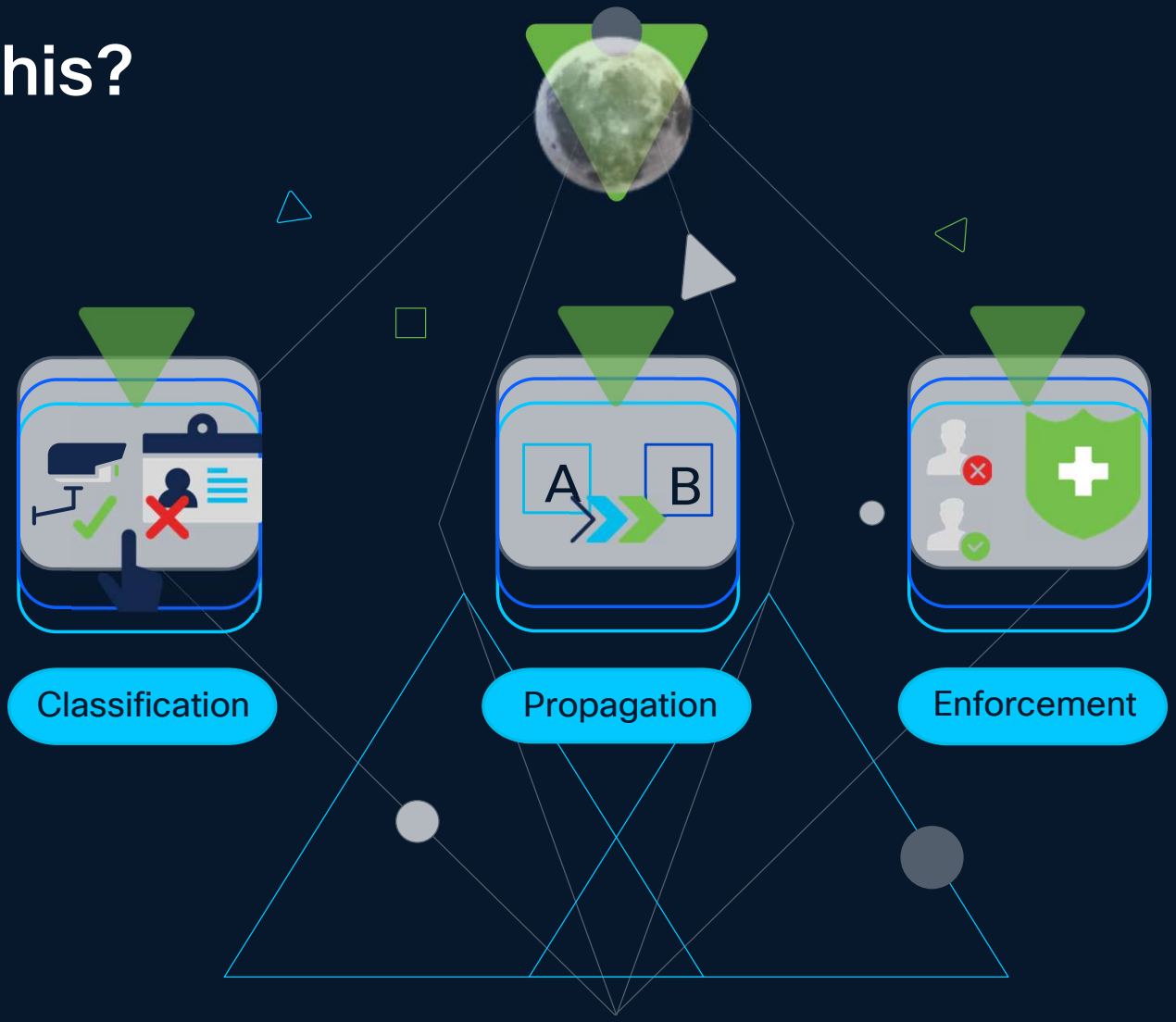
Traditional Segmentation – We lack the business intent

```
access-list 102 permit tcp 100.126.4.49 0.255.255.255 lt 1449 28.237.88.171 0.0.0.127 lt 3679
access-list 102 deny icmp 157.219.157.249 255.255.255.255 gt 1354 60.126.167.112 0.0.31.255 gt 1025
access-list 102 deny icmp 76.176.66.41 0.255.255.255 lt 278 169.48.105.37 0.0.1.255 gt 968
access-list 102 permit ip 8.88.141.113 0.0.0.127 lt 2437 105.145.196.67 0.0.1.255 lt 4167
access-list 102 permit udp 60.242.95.62 0.0.31.255 eq 3181 33.191.71.166 255.255.255.255 lt 2422
access-list 102 permit icmp 186.246.40.245 0.255.255.255 eq 3508 191.139.67.54 0.0.1.255 eq 1479
access-list 102 permit ip 209.111.254.187 0.0.1.255 gt 4640 93.99.173.34 255.255.255.255 gt 28
access-list 102 permit ip 184.232.88.41 0.0.31.255 lt 2247 186.33.104.31 255.255.255.255 lt 4481
access-list 102 deny ip 106.79.247.50 0.0.31.255 gt 1441 96.62.207.209 0.0.0.255 gt 631
access-list 102 permit ip 39.136.60.170 0.0.1.255 eq 4647 96.129.185.116 255.255.255.255 lt 3663
access-list 102 permit tcp 30.175.189.93 0.0.31.255 gt 228 48.33.30.91 0.0.0.255 gt 1388
access-list 102 permit ip 167.100.52.185 0.0.1.255 lt 4379 254.202.200.26 255.255.255.255 gt 4652
access-list 102 permit udp 172.16.184.148 0.255.255.255 gt 4163 124.38.159.247 0.0.0.127 lt 3851
access-list 102 deny icmp 206.107.73.252 0.255.255.255 lt 2465 171.213.183.230 0.0.31.255 gt 1392
access-list 102 permit ip 96.174.38.79 0.255.255.255 eq 1917 1.156.181.180 0.0.31.255 eq 1861
access-list 102 deny icmp 236.123.67.53 0.0.31.255 gt 1181 31.115.75.19 0.0.1.255 gt 2794
access-list 102 deny udp 14.45.208.20 0.0.0.255 lt 419 161.24.159.166 0.0.0.255 lt 2748
access-list 102 permit udp 252.40.175.155 0.0.31.255 lt 4548 87.112.10.20 0.0.1.255 gt 356
access-list 102 deny tcp 124.102.192.59 0.0.0.255 eq 2169 153.233.253.100 0.255.255.255 gt 327
access-list 102 permit icmp 68.14.62.179 255.255.255.255 lt 2985 235.228.242.243 255.255.255.255 lt 2286
access-list 102 deny tcp 91.198.213.34 0.0.0.255 eq 1274 206.136.32.135 0.255.255.255 eq 4191
access-list 102 deny udp 76.150.135.234 255.255.255.255 lt 3573 15.233.106.211 255.255.255.255 eq 3721
access-list 102 permit tcp 126.97.113.32 0.0.1.255 eq 4644 2.216.105.40 0.0.31.255 eq 3716
access-list 102 permit icmp 147.31.93.130 0.0.0.255 gt 968 154.44.194.206 255.255.255.255 eq 4533
access-list 102 deny tcp 154.57.128.91 0.0.0.255 lt 1290 106.233.205.111 0.0.31.255 gt 539
access-list 102 deny ip 9.148.176.48 0.0.1.255 eq 1310 64.61.88.73 0.0.1.255 lt 4570
access-list 102 deny ip 124.236.172.134 255.255.255.255 gt 859 56.81.14.184 255.55.255.255 gt 2754
access-list 102 deny icmp 227.161.68.159 0.0.31.255 lt 3228 78.113.205.236 255.55.255.255 lt 486
access-list 102 deny udp 167.160.188.162 0.0.0.255 gt 4230 248.11.187.246 0.255.255.255 eq 2165
```

Security Groups

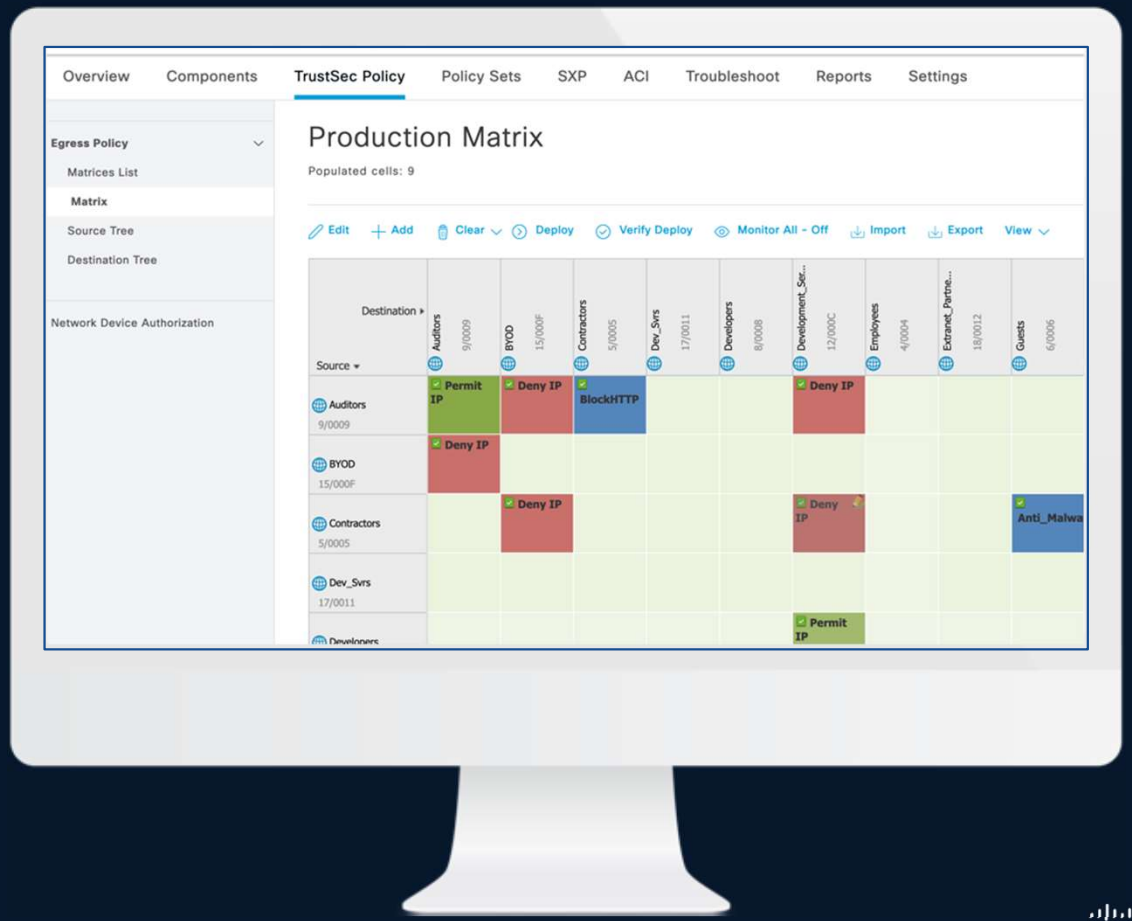
How can we solve this?

TrustSec is a next-generation access control method that can greatly enhance the performance, scalability, and manageability of your network.



TrustSec Matrix

- The TrustSec Matrix is where you define which SGACL is applied per SGT
- The matrix displays source SGTs on the left and destination SGTs on the top
- The intersection of the rows and columns are the actual enforcement instructions based on the SGACL



DC

Segmentation and Policy Control Challenges

Current: Siloed Tools & Policies

Challenges

- Siloed Teams & Tools
- Inconsistent Policies
- Lack of Visibility & Control

Protecting workloads at network AND process level

Network level segmentation | Process level segmentation

Data Center Edge (Perimeter) Firewall

A DC perimeter firewall primarily

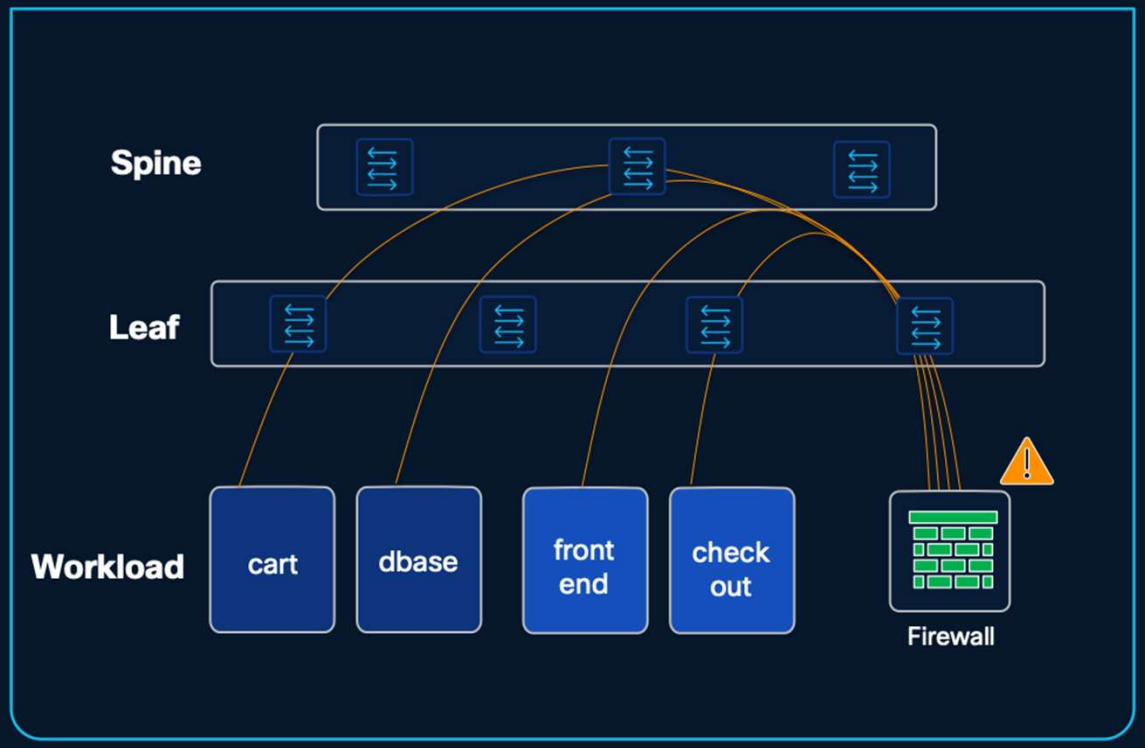
protects *north-south* traffic by blocking external threats, scale + efficacy

securing critical workloads, enforcing least-privilege access, supporting *compliance, and ensuring business continuity.*

supports *advanced application-aware security, encrypted traffic inspection*,

Traffic management complexity moving traffic to and from firewall clusters

Traditional architecture creates east-west bottlenecks



Firewalls excel at perimeter defense and compliance

- IPS/IDS
- URL Filtering
- NAT, Identity, others.

But lateral traffic defense needs a different approach

- Hair pinning adds latency
- Architectural limits create visibility gaps
- Scaling east-west security is costly

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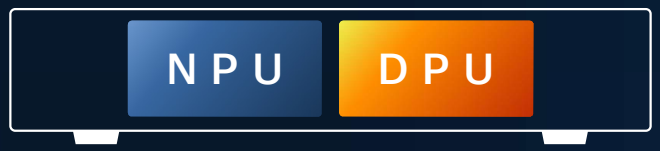
SMART SWITCH

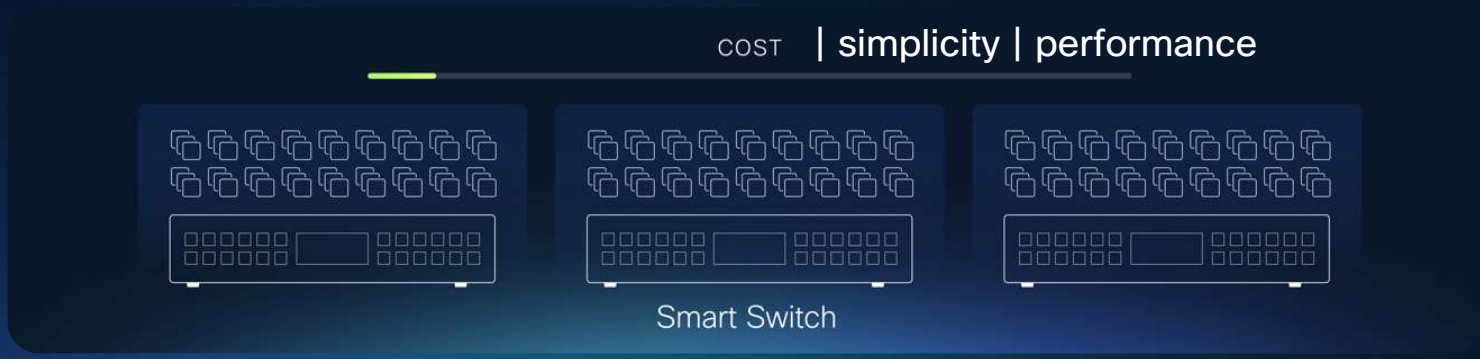


Inspecting packets

Moving packets from A to B

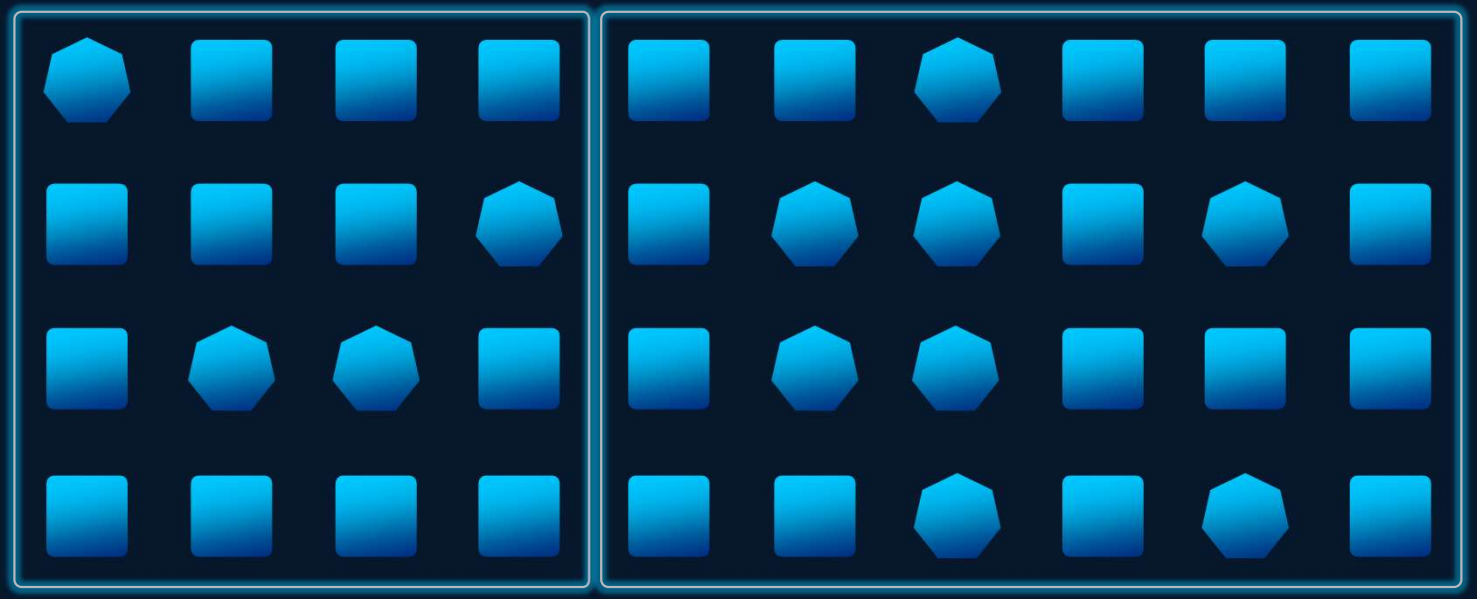
Firewall
on every server port

Top of Rack Smart Switch
on every server port



MACROSEGMENTATION

MICROSEGMENTATION



Dev

Prod

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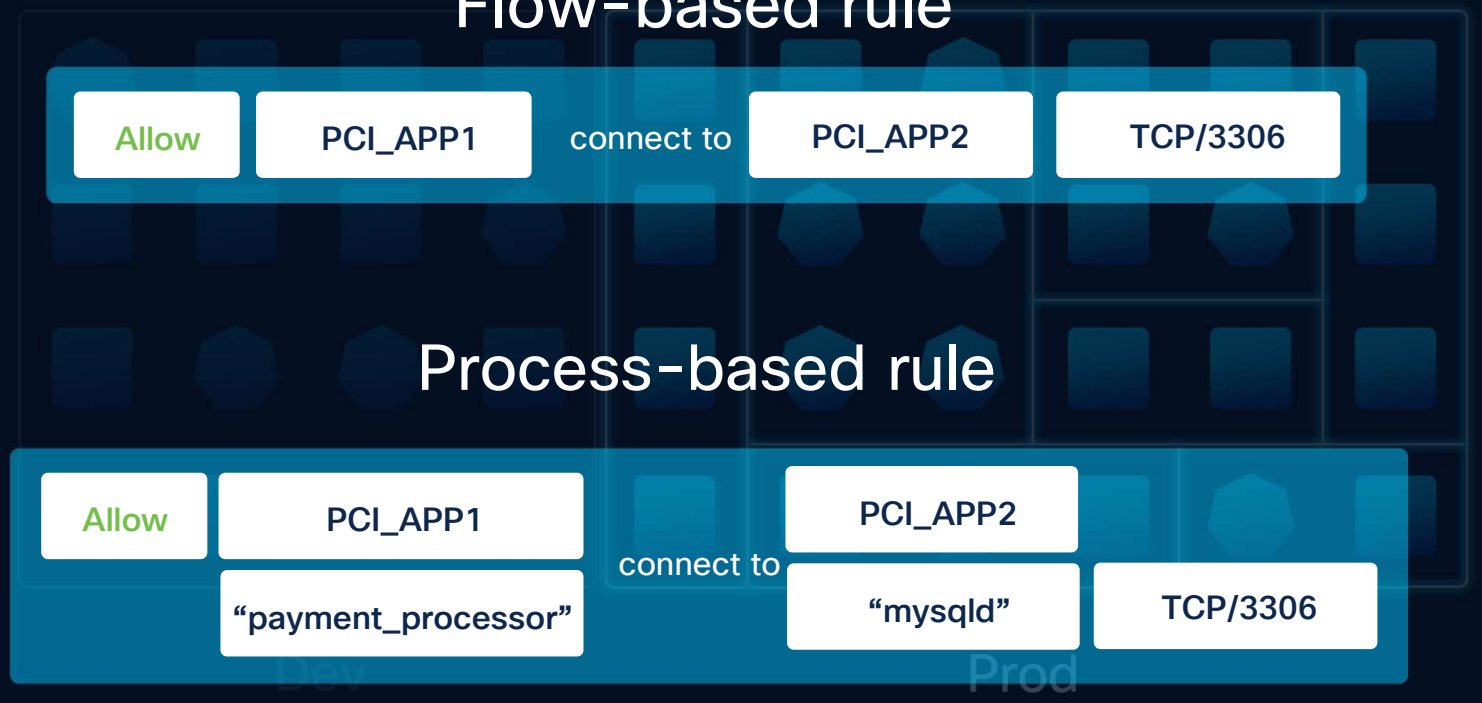
MACROSEGMENTATION

MICROSEGMENTATION



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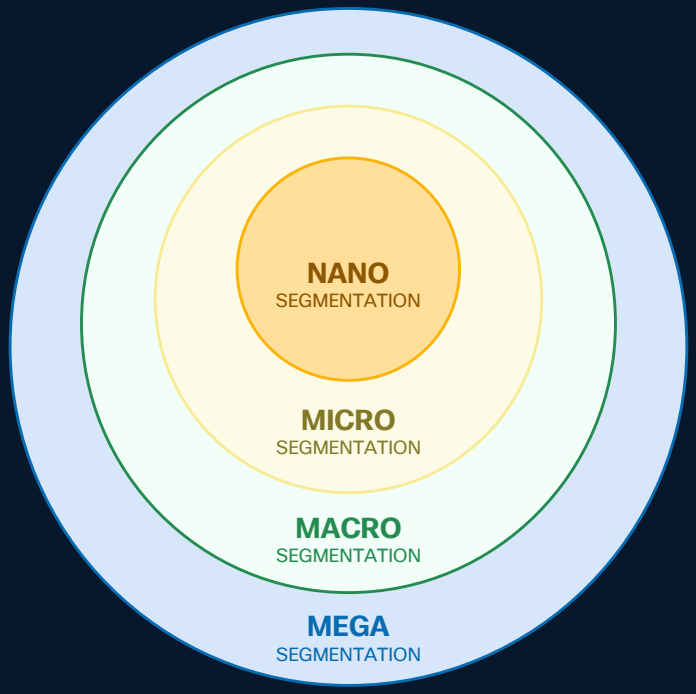
Importance of NANO Segmentation



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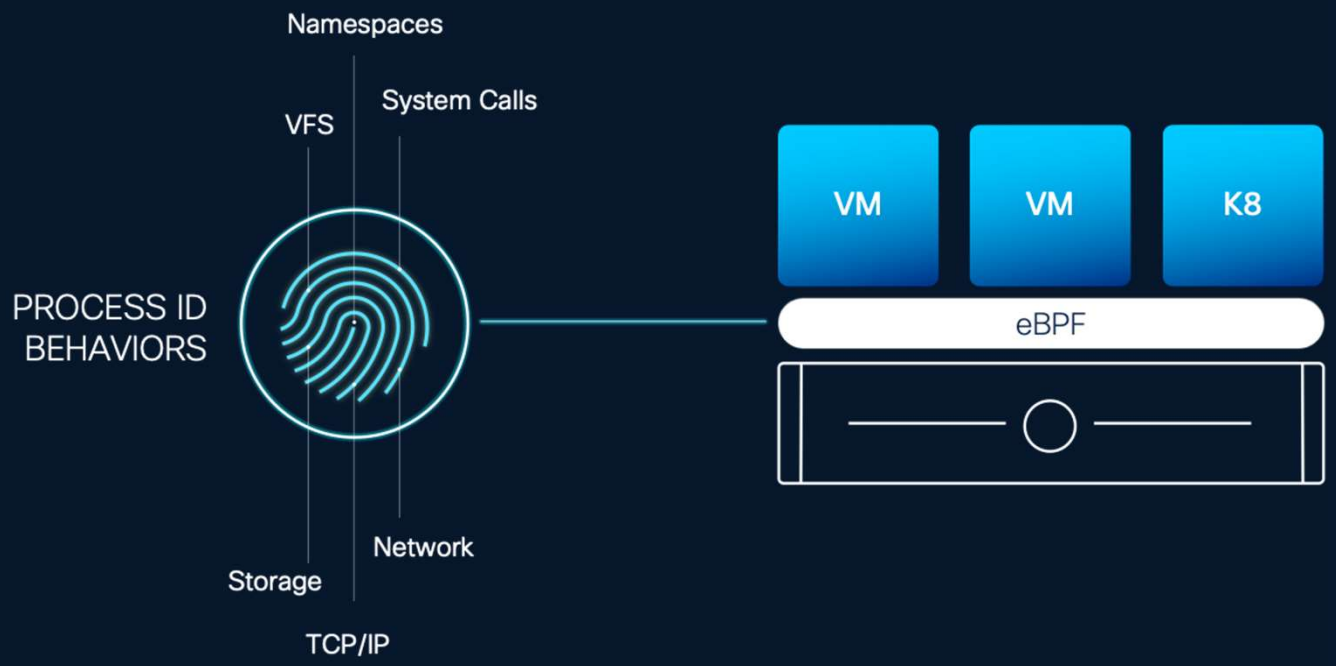
Nano Segmentation (The Process)
- The highest level of precision; enforced at the OS, container, or process level.
- Focuses on individual service-to-service communication and API-level security within a single workload.

eBPF Provides Visibility Deep into the Workload



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Summary

Secure Network

Any DC network that claims to be secure must support Mirco/Nano-segmentation

Ability to segment east-west traffic

Shrink the attack surface for better security

Auditing, compliance and conformance

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