



**SOITRON**<sup>\*</sup>  
INSPIRÁRIUM

**SOFTWARE  
DEFINED  
WAN**

**17. 12. 2020  
9:00 - 10:30 hod.**



# AGENDA

- Prezentácia SD WAN 30 minút
- Ukážky 50 minút
- Otázky a zhrnutie 10 minút
- Mikrofóny sú počas prezentácie vypnuté (Mute)
- Otázky môžete písať v priebehu prezentácie do Q&A
- Na záver bude diskusia k prípadným otázkam

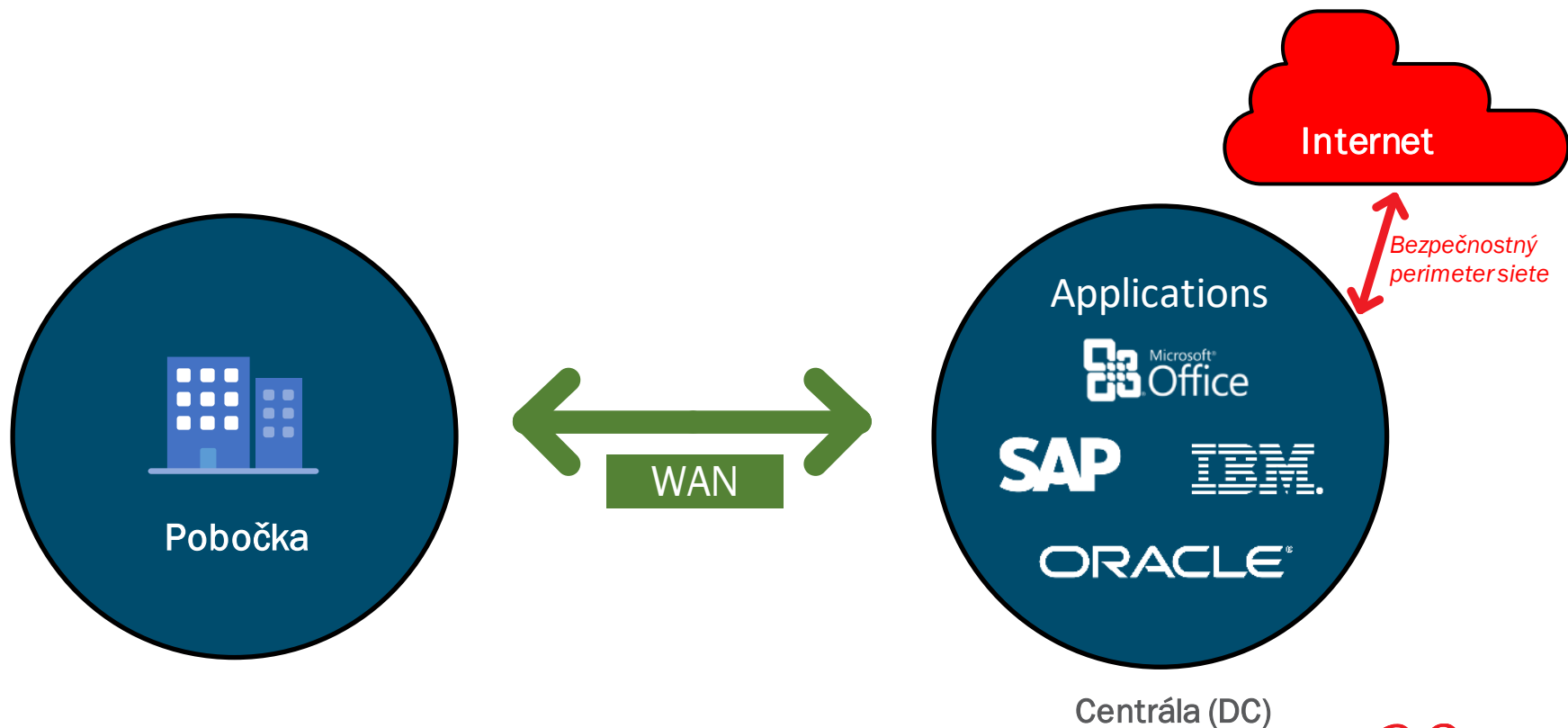


# Úvod k SD WAN





## Konektivita medzi pobočkou a centrárou (DC) bola prioritná

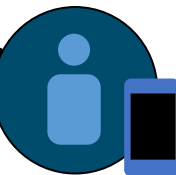


## Dnes sa ale komunikačné toky menia...

Pobočkoví používatelia



Mobilní používatelia



Inteligentná a  
flexibilná sieť  
SD WAN

Microsoft  
Office

ORACLE IBM

SAP Cisco Webex

Centrálna (DC)

salesforce

CONCUR

Office 365

Dropbox

Cisco Webex

SaaS

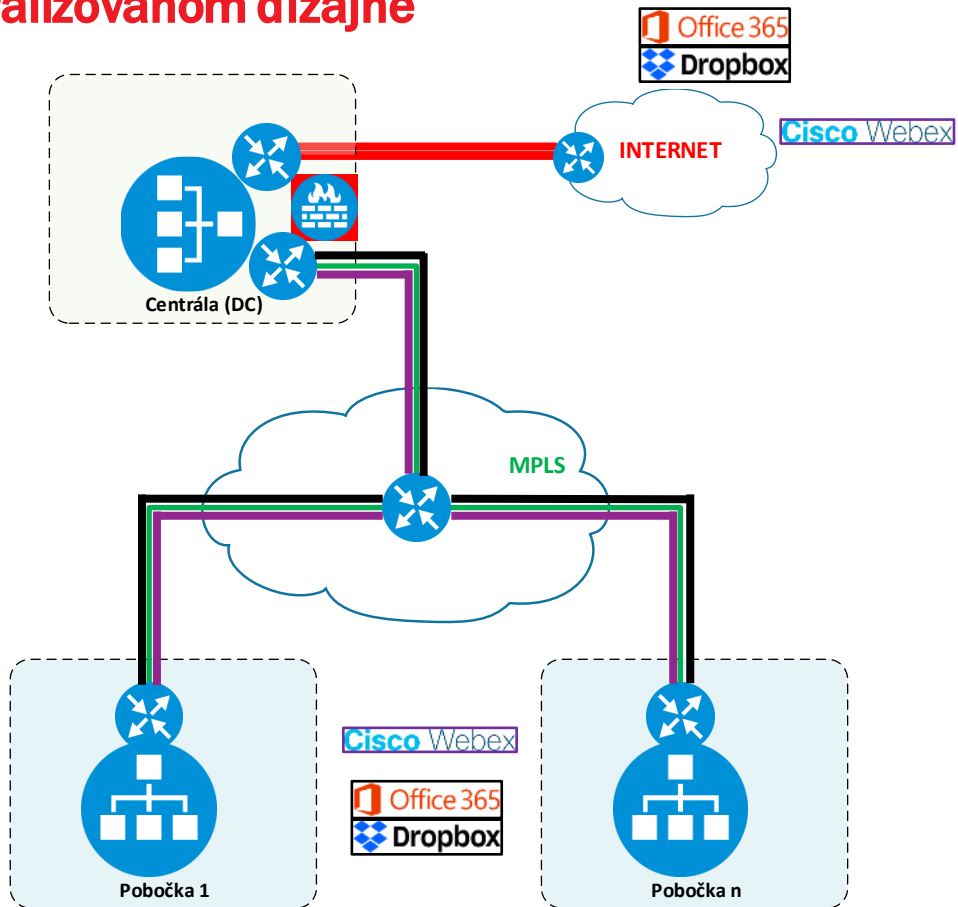
amazon  
web services

Azure

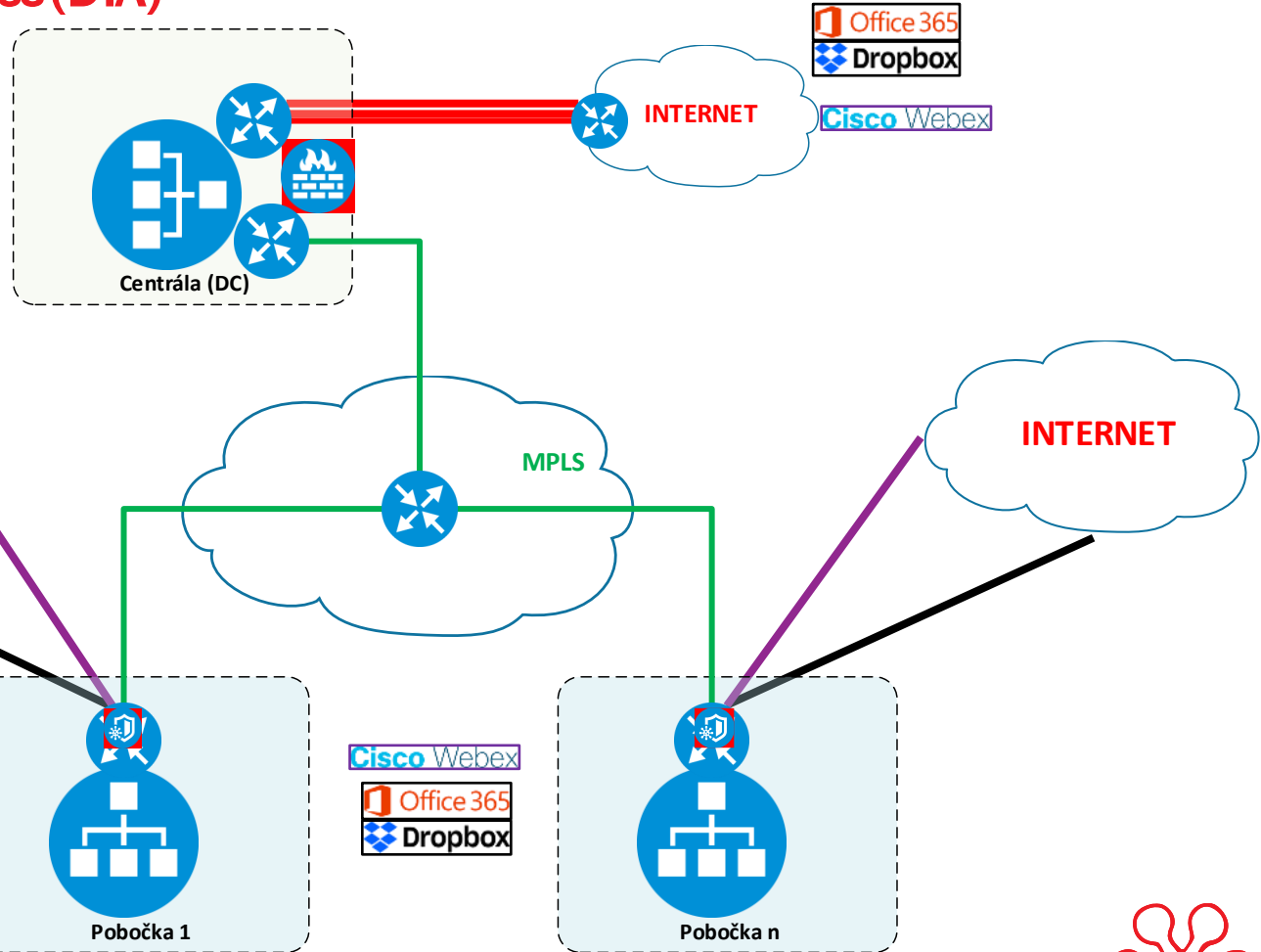
Google Cloud

IaaS

# Cloud aplikácie v centralizovanom dizajne

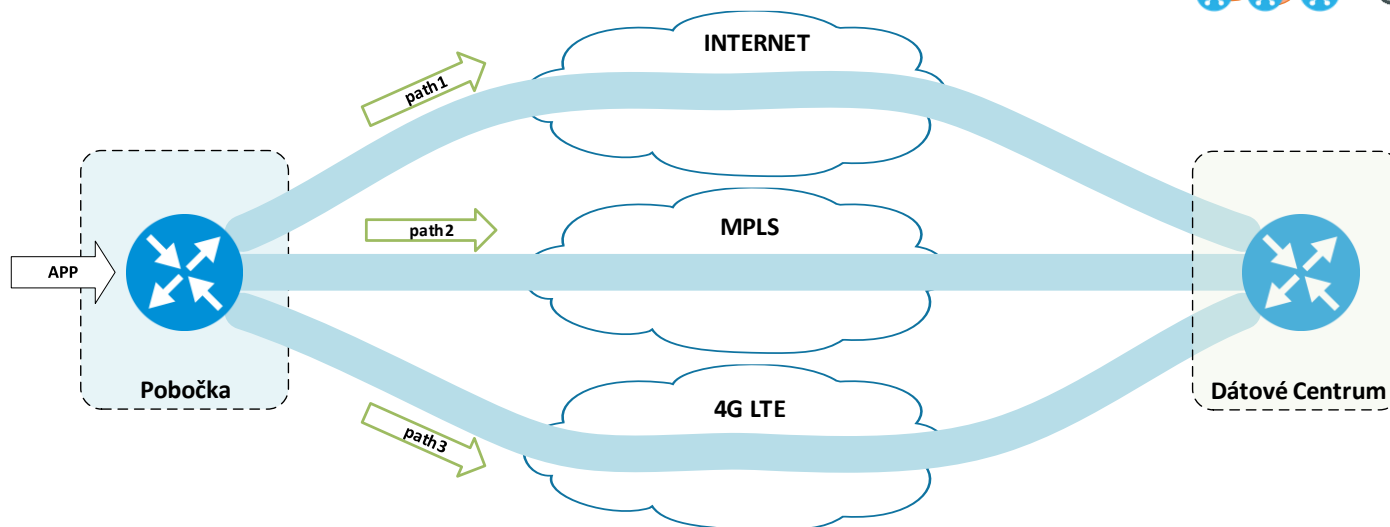


# Direct Internet Access (DIA)

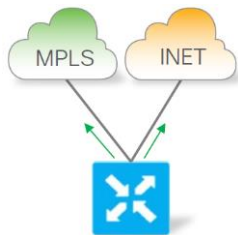




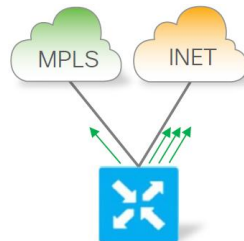
# Load balancing dát v SD WAN sieti



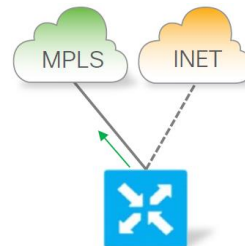
Default = Active/Active



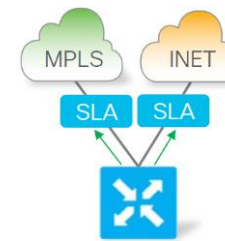
Weighted = Active/Active



App. Pinning = Active/Backup



AAR (SLA)

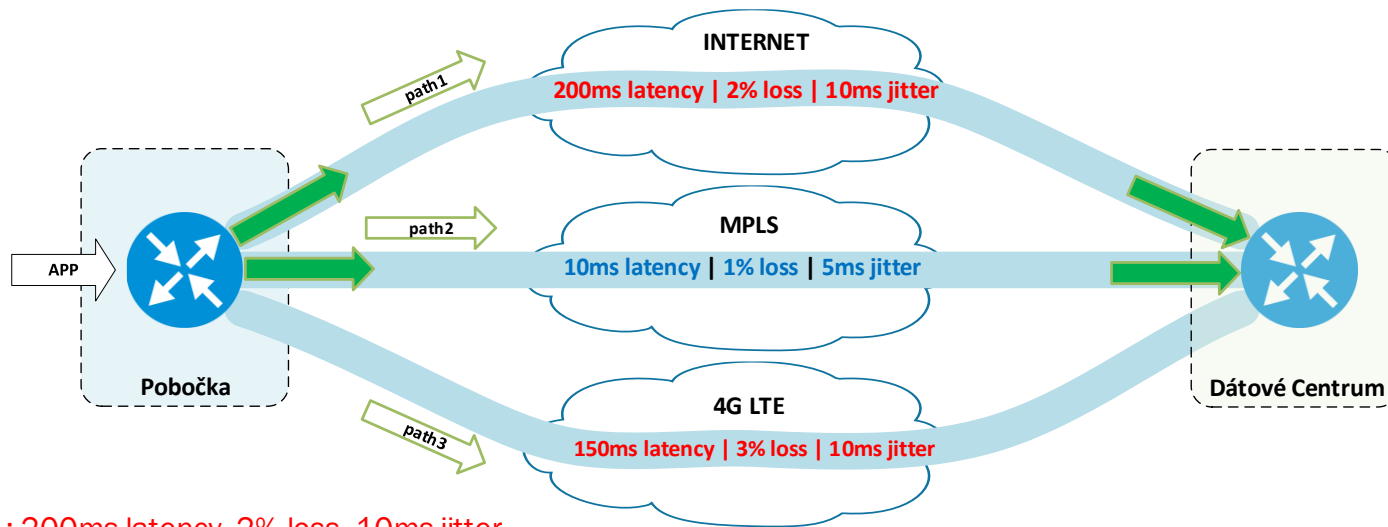


# Zabezpečenie optimálneho prenosu kritickej aplikácie

SD WAN routre automaticky monitorujú transportné linky



Definujeme SLA pre zvolenú aplikáciu:  
Latency < 150  
Loss < 2%  
Jitter < 10ms



Path 1: 200ms latency, 2% loss, 10ms jitter

Path 2: 10ms latency, 1% loss, 5ms jitter

Path 3: 150ms latency, 3% loss, 10ms jitter

IPSec

SD WAN edge router

## Poskytovatelia SD WAN riešení

- V oblasti SD WAN ponúka v súčasnosti svoje produkty a riešenia cez 60 poskytovateľov.
- Prečo práve **Cisco** a **Fortinet**?
  - Podľa spoločnosti Gartner obe spoločnosti patria k lídrom na tomto trhu.
  - Produkty a riešenia spoločností Cisco a Fortinet sú súčasťou produktového portfólia spoločnosti Soitron a v súčasnosti ich poznajú a používajú vo svojich sieťach aj naši zákazníci.



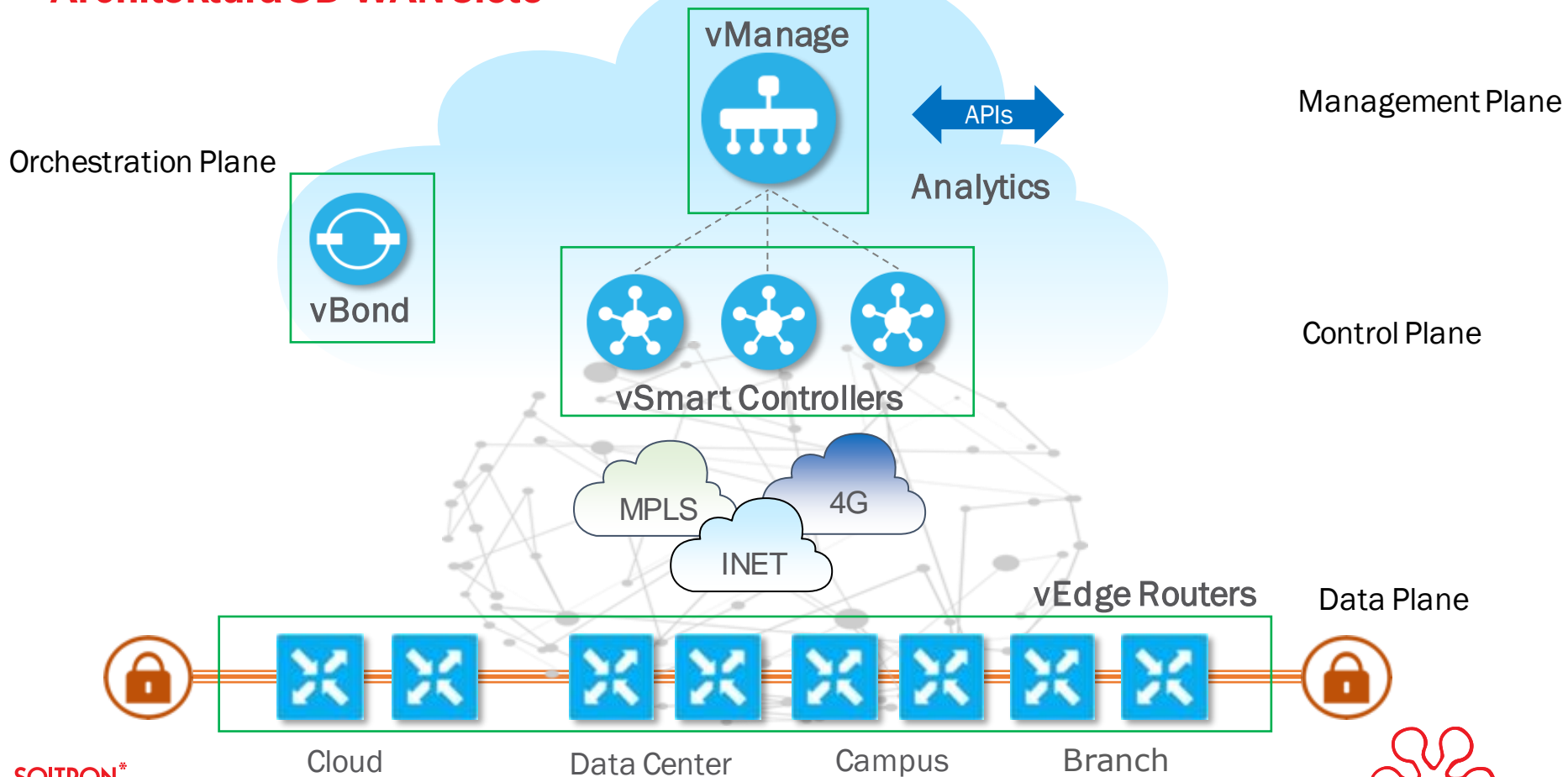
# Predstavenie architektúr riešení



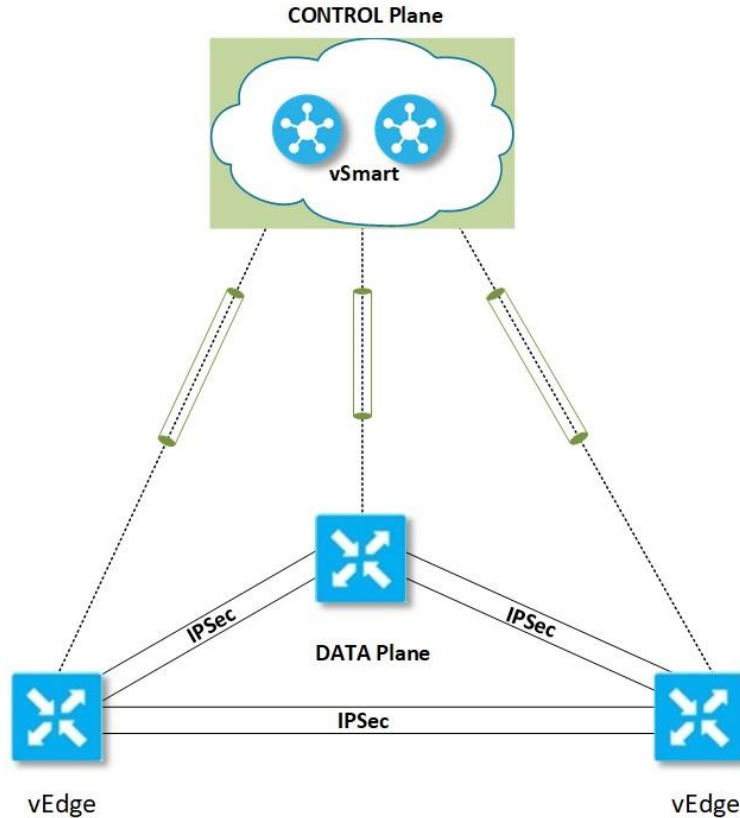
# Cisco



# Architektúra SD WAN siete



# Architektúra SD WAN siete

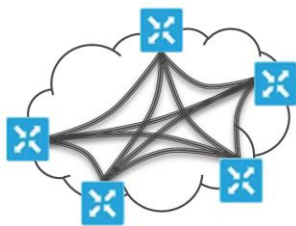
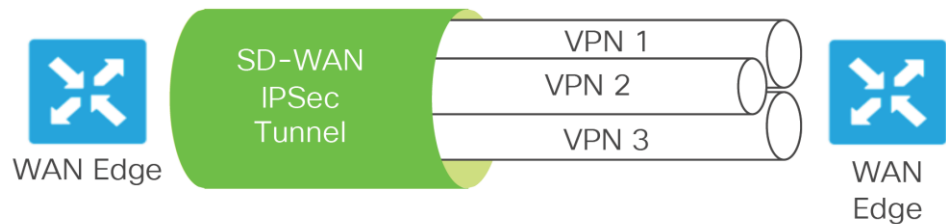


## Secure Control Channel (TLS/DTLS)

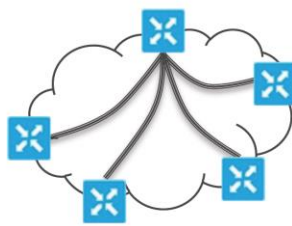
OMP ..... Routes, policy, keys  
Netconf ..... Config, stats, SNMP



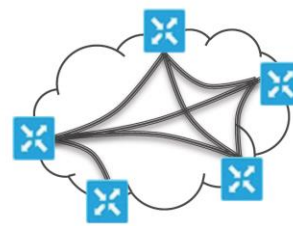
# Oddelenie prenosu používateľských sietí



Full-Mesh



Hub-and-Spoke

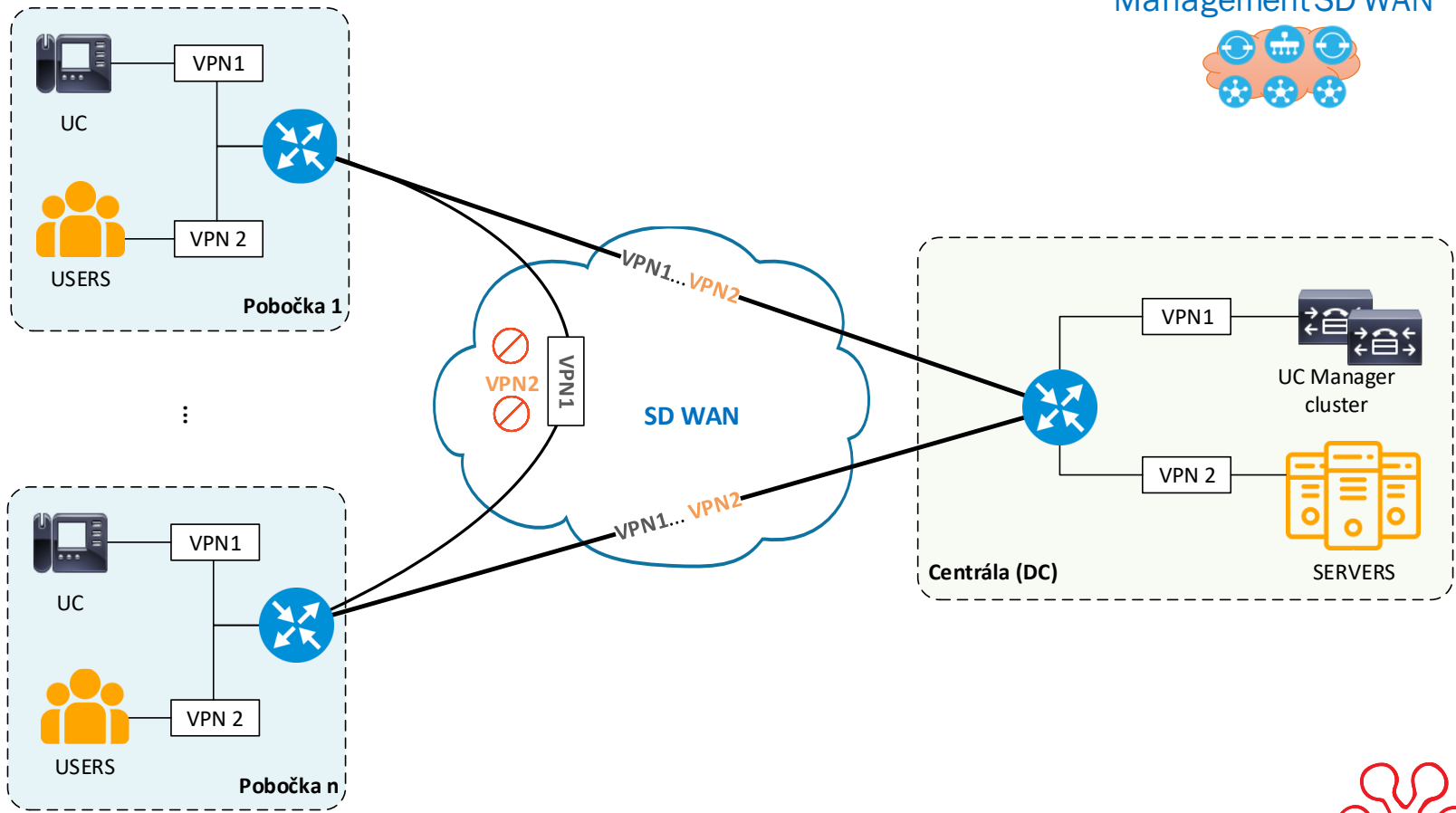


Partial Mesh





# Oddelenie prenosu používateľských sietí



# Fortinet



# Fortinet SD WAN

- Fortinet - zameranie na Security
- Fortinet SDWAN edge = HW Firewall
- Spojenie NGFW a SDWAN konceptu
- Konvergencia Networkingu a Security v jednej platforme

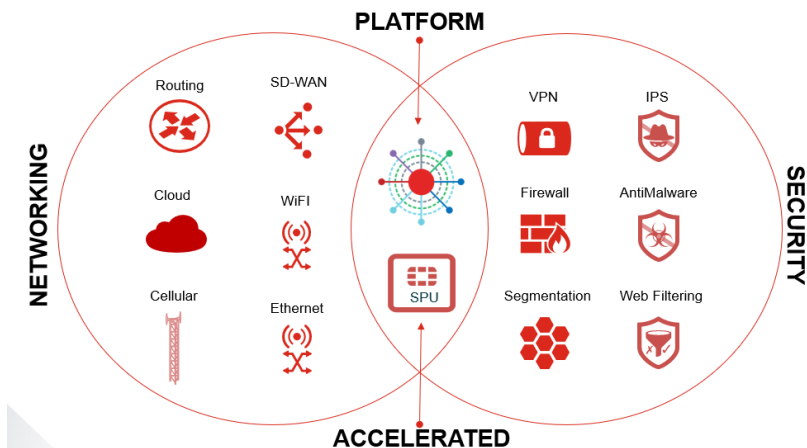


Figure 1. Magic Quadrant for Network Firewalls



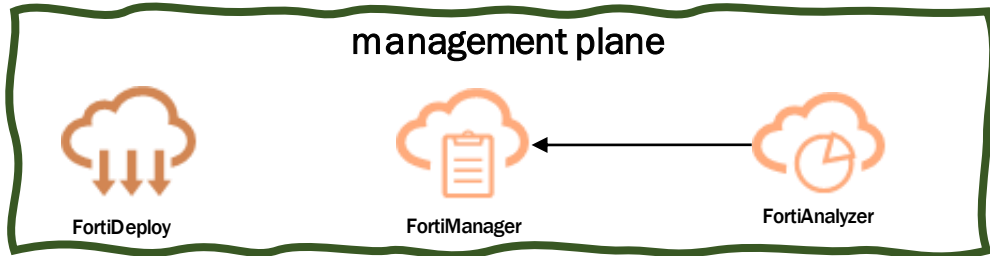
Figure 1. Magic Quadrant for WAN Edge Infrastructure



Source: Gartner (September 2020)



# Architecture solution - Fortinet



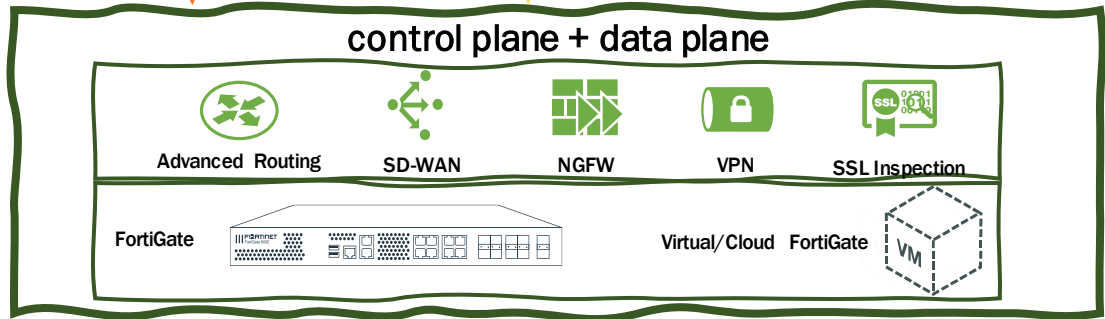
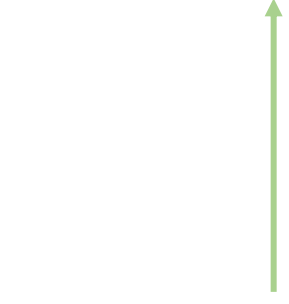
Cloud connectors



Zero Touch & Provision



Orchestrate & Automate & Monitor

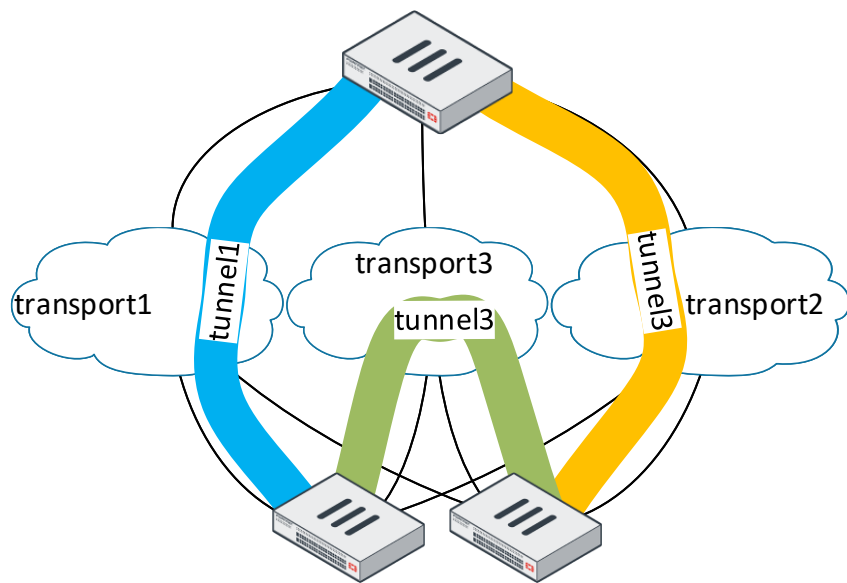


- Spoločný Control & Data plane: Fortigate
- Orchestrácia: FortiManager
- Provision : FortiDeploy
- Analytika: FortiAnalyzer

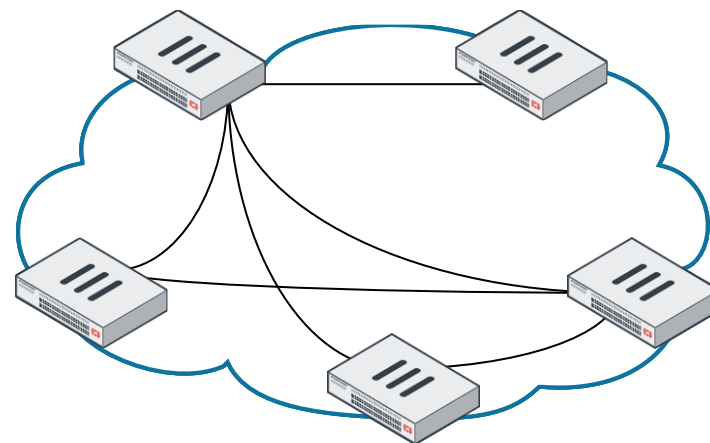


# Podporované topológie

- Možná dátová komunikácia v SDWAN cez:
  - Underlay - Fyzické rozhranie
  - Overlay – IPsec Tunel



- Overlay siete:
  - Mesh
  - Hub & Spoke
  - Mix (VPN shortcuts)



# Vlastnosti - sumarizácia



## Vlastnosti riešení Cisco / Fortinet pre SD WAN

	Cisco	Fortinet
<b>Architecture components</b>	Orchestration: vBond Management: Vmanage Control: vSmart Data: vEdge	Orchestration: FortiManager Management: FortiManager Data&Control: FortiGate
<b>Edge Type</b>	Routing platform	NGFW platform
<b>WAN Topology</b>	Hub&Spoke Mesh Mixed Per-VPN topology	Hub&Spoke Mesh Mixed
<b>Segmentácia</b>	Áno (VPN)	Áno (VDOM,VRF)



## Porovnanie Cisco / Fortinet SD WAN

	Cisco	Fortinet
<b>Dual A/A SD-WAN</b>	Áno - single box & dual box	Áno - single box & dual box
<b>Direct internet access</b> <small>*s app visibility</small>	Áno	Áno
<b>WAN optimization</b>	Áno TCP optimization, FEC waas za príplatok	Áno TCP optimization, FEC
<b>Visibility</b>	vManage	FortiAnalyzer
<b>Typy rozhraní</b>	Ethernet, Wifi, LTE, xDSL	Ethernet, Wifi, LTE, xDSL
<b>Modely nasadenie</b>	On prem & cloud	On prem & cloud





## Porovnanie Cisco / Fortinet SD WAN

	Cisco	Fortinet
<b>Virtual platforms &amp; Cloud integration</b>	Áno	Áno
<b>Zero touch provisioning</b>	Áno	Áno
<b>Advanced routing Protocols - BGP, OSPF</b>	Áno	Áno
<b>AAR (application aware routing) connectivity SLA</b>	Áno	Áno
<b>Integrovaťelná Security</b>	FW, DNS/URL, AMP, IPS	FW, DNS/URL, AMP, IPS



# Bezpečnost



# Možnosti zabezpečenia SD WAN sietí



## Enterprise Firewall

Layer 3 to 7 apps classified

## Intrusion Protection System

Most widely deployed IPS engine in the world

## URL-Filtering

Web reputation score using 82+ web categories

## Adv. Malware Protection

With File Reputation and Sandboxing (TG)

## Secure Internet Gateway

DNS Security/Cloud FW with Cisco Umbrella

## SSL Proxy

Detect Threats in Encrypted Traffic



# SD WAN a bezpečnosť

## WAN Edge konsolidácia



### Security Services



FortiGuard  
Labs



FortiSandbox



Security  
Rating  
Service

### Next Generation Firewall funkcionality



SSL  
Inspection



Content  
Filter



IPS



Anti-Botnet



App  
Control



Reputation



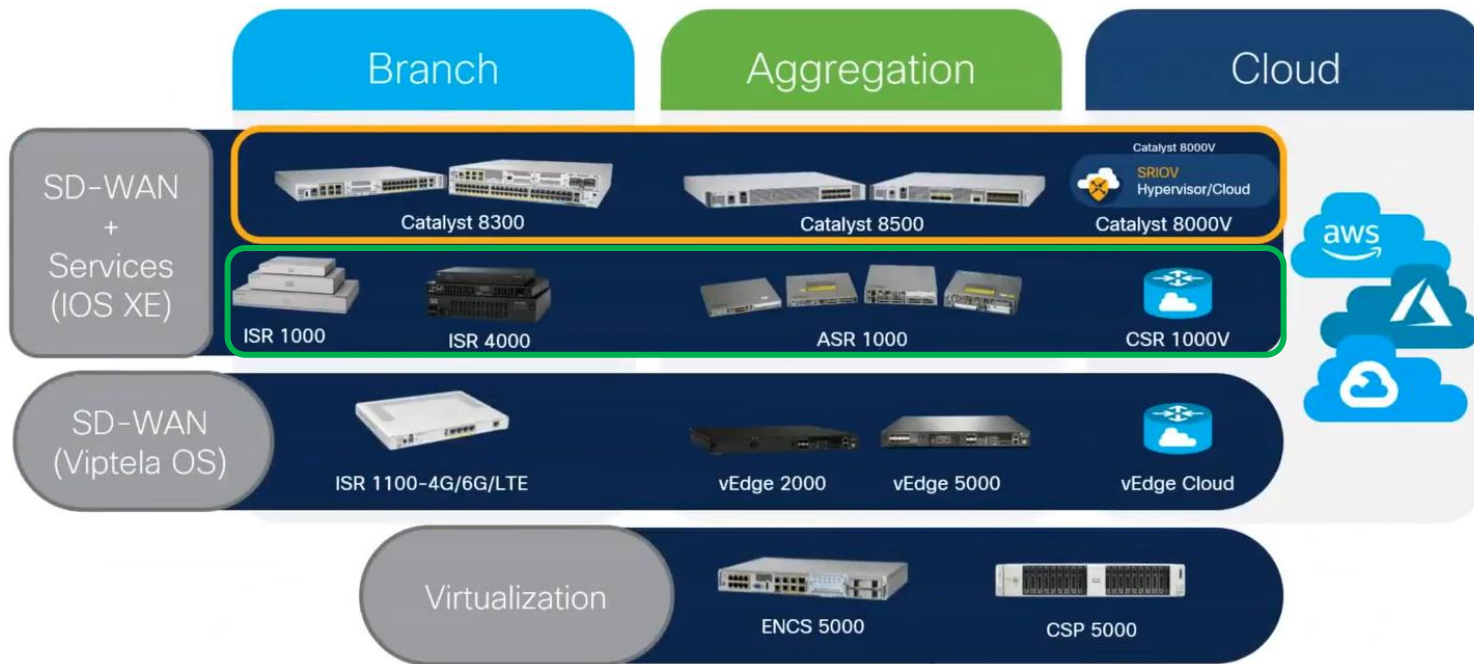
Antivirus



# Produktová část



# Produktové portfólio Cisco



# Licencovanie

Platform		License type	SD WAN	10 Mbps	25 Mbps	50 Mbps	100 Mbps	250 Mbps	500 Mbps	1 Gbps	2.5 Gbps	5 Gbps	10 Gbps
ISR 4000	ISR 4221	Cisco DNA Premier	✓	✓	✓	✓	✓						
		Cisco DNA Advantage	✓	✓	✓	✓	✓						
		Cisco DNA Essentials	✓	✓	✓	✓	✓						
ISR 4321	ISR 4321	Cisco DNA Premier	✓	✓	✓	✓	✓						
		Cisco DNA Advantage	✓	✓	✓	✓	✓						
		Cisco DNA Essentials	✓	✓	✓	✓	✓						
ISR 4331	ISR 4331	Cisco DNA Premier	✓		✓	✓	✓	✓					
		Cisco DNA Advantage	✓		✓	✓	✓	✓					
		Cisco DNA Essentials	✓		✓	✓	✓	✓					
ISR 4351	ISR 4351	Cisco DNA Premier	✓		✓	✓	✓	✓					
		Cisco DNA Advantage	✓		✓	✓	✓	✓					
		Cisco DNA Essentials	✓		✓	✓	✓	✓					
ISR 4431	ISR 4431	Cisco DNA Premier	✓		✓	✓	✓	✓	✓				
		Cisco DNA Advantage	✓		✓	✓	✓	✓	✓				
		Cisco DNA Essentials	✓		✓	✓	✓	✓	✓				
ISR 4451	ISR 4451	Cisco DNA Premier	✓		✓	✓	✓	✓	✓	✓			
		Cisco DNA Advantage	✓		✓	✓	✓	✓	✓	✓			
		Cisco DNA Essentials	✓		✓	✓	✓	✓	✓	✓			
ISR 4461	ISR 4461	Cisco DNA Premier	✓		✓	✓	✓	✓	✓	✓		✓	
		Cisco DNA Advantage	✓		✓	✓	✓	✓	✓	✓		✓	
		Cisco DNA Essentials	✓		✓	✓	✓	✓	✓	✓			




# Portfólio Fortigate

150 Mbps

Threat protection throughput


7 Gbps



**FG- 80E Series**  
**FG/FWF- 60E/60F Series**  
**FG/FWF- 40F Series**  
**FG/FWF- 30E/50E Series**

NGFW  
Secure SD-WAN

<b>950 Mbps – 10 Gbps</b> Forward Throughput	<b>200 Mbps - 1 Gbps</b> NGFW Throughput	GE RJ45   GE RJ45 PoE+   GE SFP Variants: 10G   1x 10Gb 20x40   Intel® I350   Puggadottir
<b>300 Mbps – 1.4 Gbps</b> IPS Throughput	<b>150 Mbps - 700 Mbps</b> Threat Protection Throughput	



**FG-900D** **FG-400E**  
**FG-800D** **FG-300E**  
**FG-600E** **FG-200E Series**  
**FG-500E** **FG-100F Series**

NGFW  
Secure SD-WAN  
SWG (100 users)  
IPS (100 users)

<b>7.4 Gbps – 50 Gbps</b> Forward Throughput	<b>360 Mbps – 9.5 Gbps</b> NGFW Throughput	GE RJ45   GE SFP   10GE SFP+
<b>500 Mbps – 10 Gbps</b> IPS Throughput	<b>250 Mbps – 7 Gbps</b> Threat Protection Throughput	





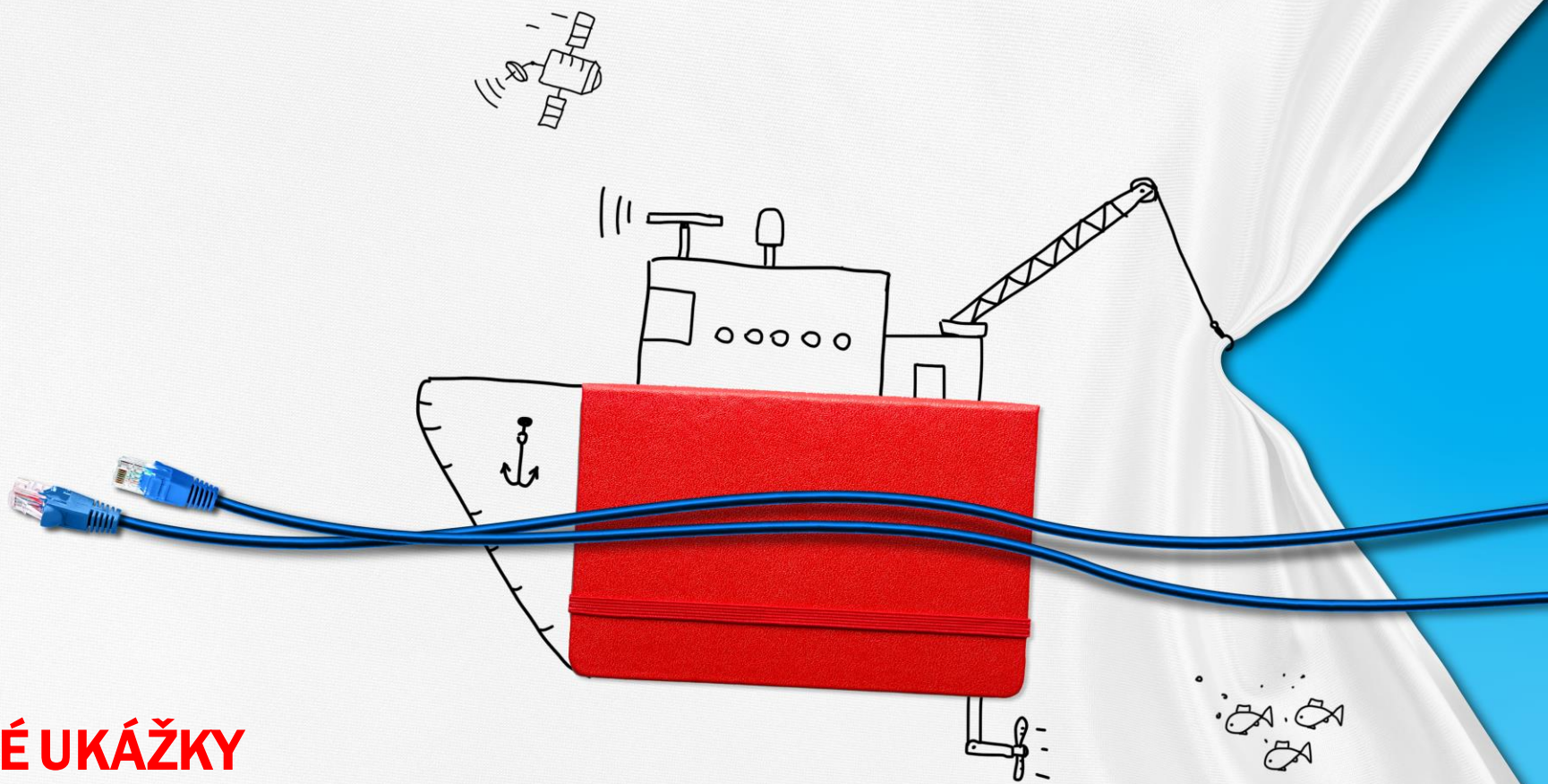
## Licencovanie Fortinet- bundles

Bundles	360 Protection	Enterprise Protection	Unified Threat Protection	Threat Protection
FortiCare	ASE <sup>1</sup>	24x7	24x7	24x7
FortiGuard App Control Service	•	•	•	•
FortiGuard IPS Service	•	•	•	•
FortiGuard Advanced Malware Protection (AMP) — Antivirus, Mobile Malware, Botnet, CDR, Virus Outbreak Protection and FortiSandbox Cloud Service	•	•	•	•
FortiGuard Web Filtering Service	•	•	•	
FortiGuard Antispam Service	•	•	•	
FortiGuard Security Rating Service	•	•		
FortiGuard Industrial Service	•	•		
FortiGuard IoT Detection Service <sup>2</sup>	•	•		
FortiConverter Service	•	•		
IPAM Cloud <sup>2</sup>	•			
SD-WAN Orchestrator Entitlement <sup>2</sup>	•			
SD-WAN Cloud Assisted Monitoring	•			
SD-WAN Overlay Controller VPN Service	•			
FortiAnalyzer Cloud	•			
FortiManager Cloud	•			



# Anketa





**ŽIVÉ UKÁŽKY**



# Záver



## Zhrnutie

- Čo nám SDWAN prináša...
- Ktorá je tá pravá..
- Príprava...
- PoC...
  
- A čo ďalej v SDx?

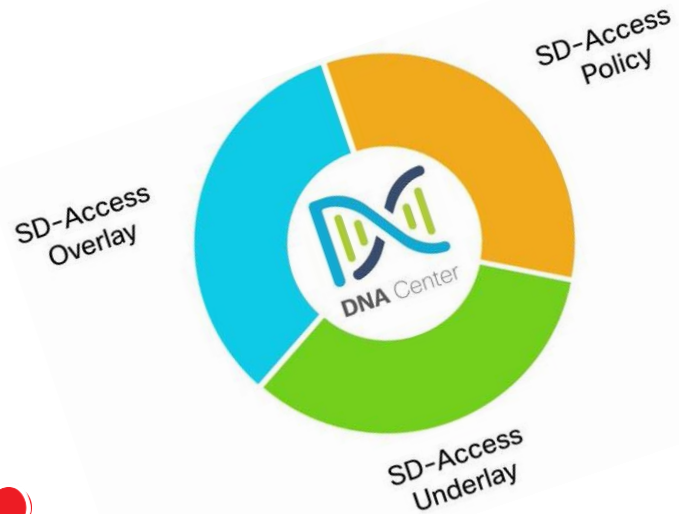




## 3. webinár

### SD LAN

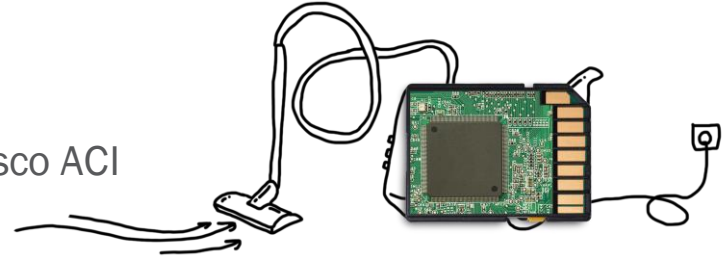
\* Powered by Cisco DNAC



## 4. webinár

### SD DC

\* Powered by Cisco ACI



Otázky?



010100  
11101  
00101

111





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Kontakty



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**ĎAKUJEME**



**SOITRON\***