

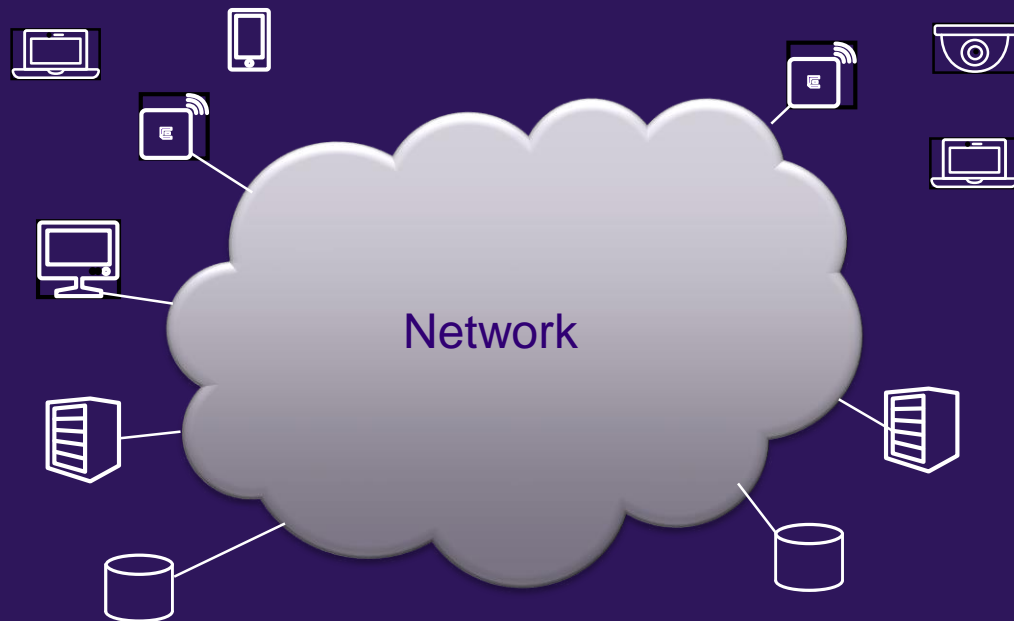


Современный подход к построению корпоративной инфраструктуры

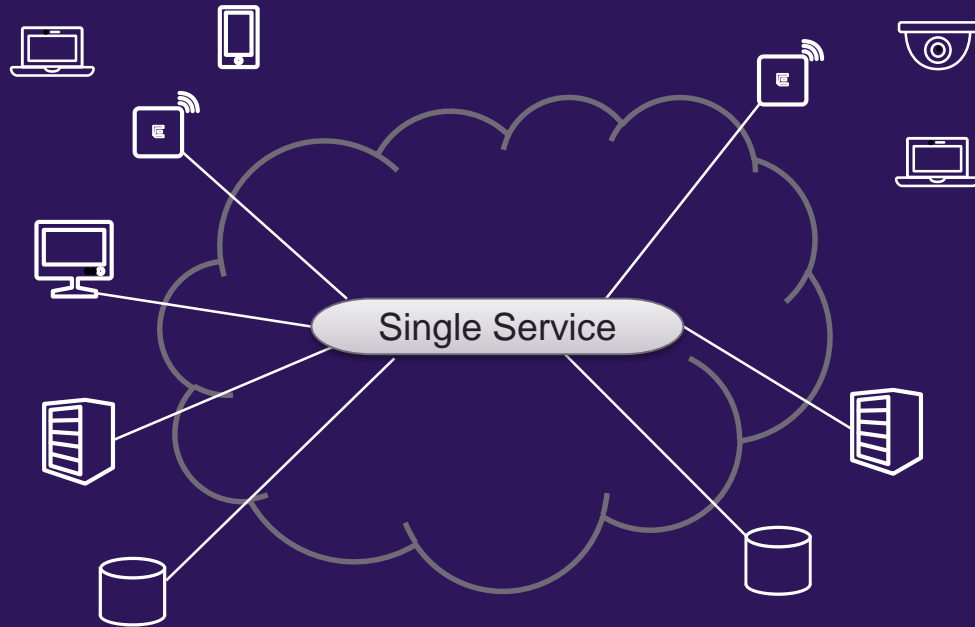
Денисов Павел

Системный инженер

Классический сетевой дизайн

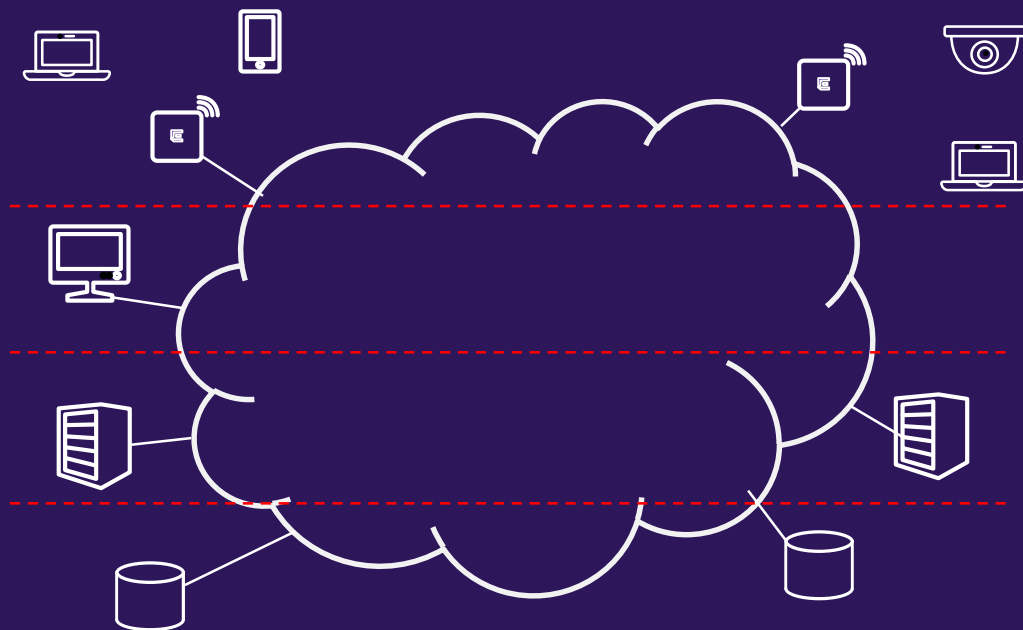


Используется OSPF в ядре и VLAN на уровне доступа



Is this secure? Does it fulfill all business requirements?

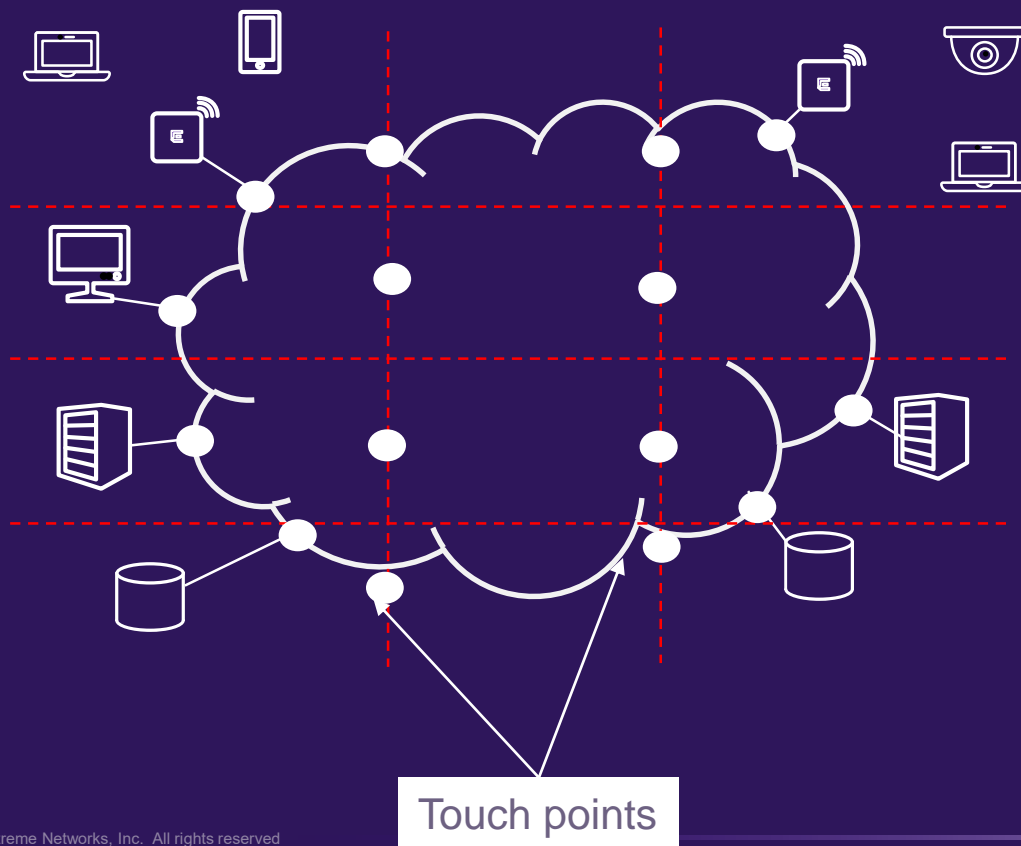
Сложности на пути сетевого архитектора



Logical Segmentation

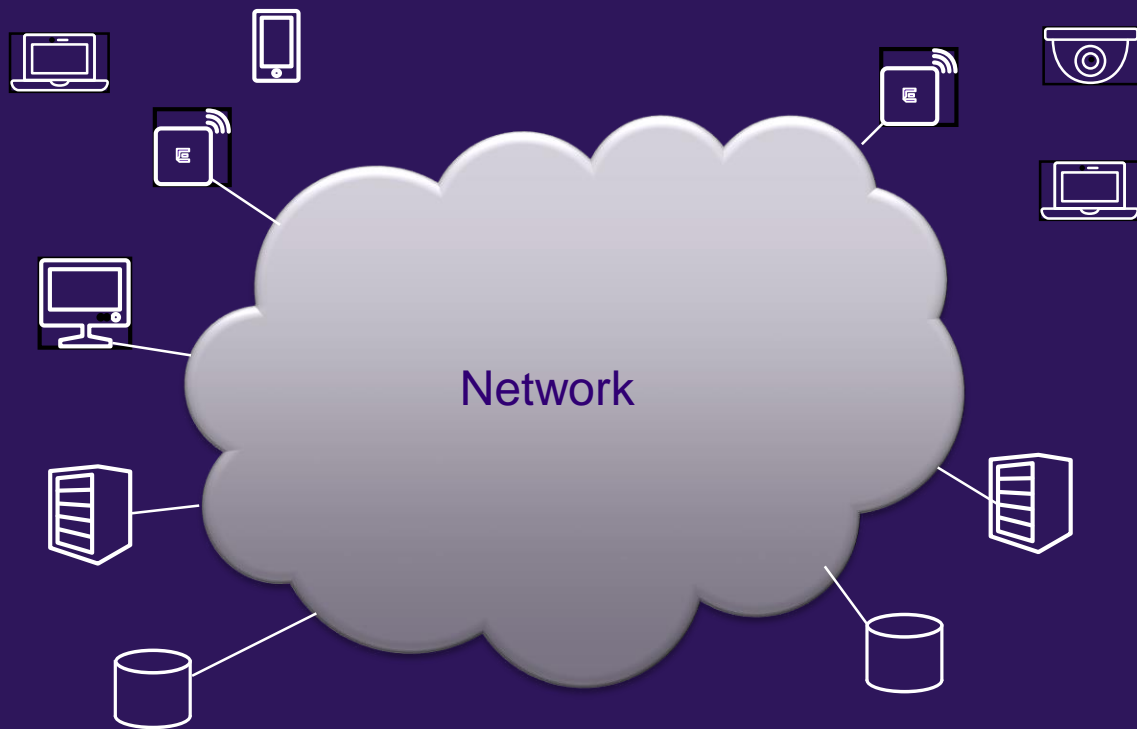
- Creates multiple parallel instances
- Many protocol instances

Основные сложности классического подхода

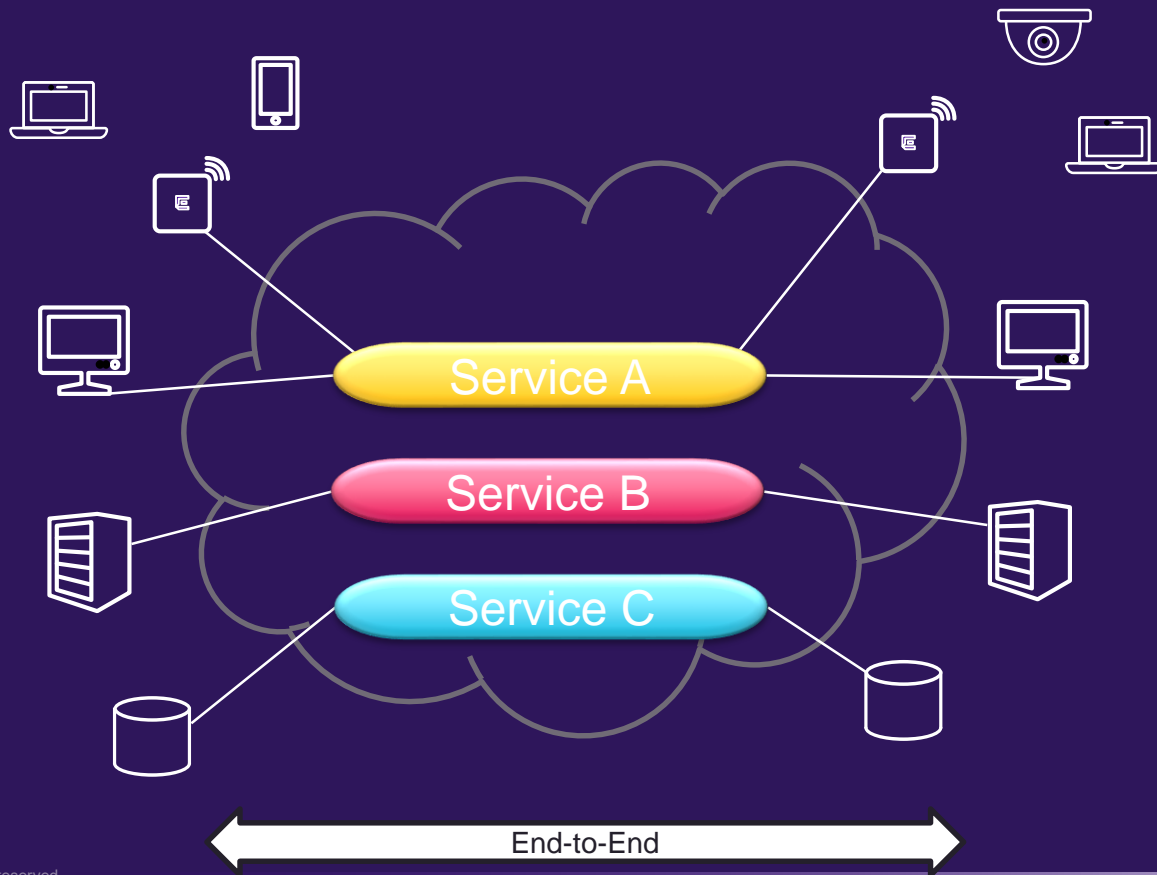


- Logical Segmentation
- **Physical Segmentation**
 - Technology breaks (LAN, MAN, WAN, DC)
 - Many Protocols

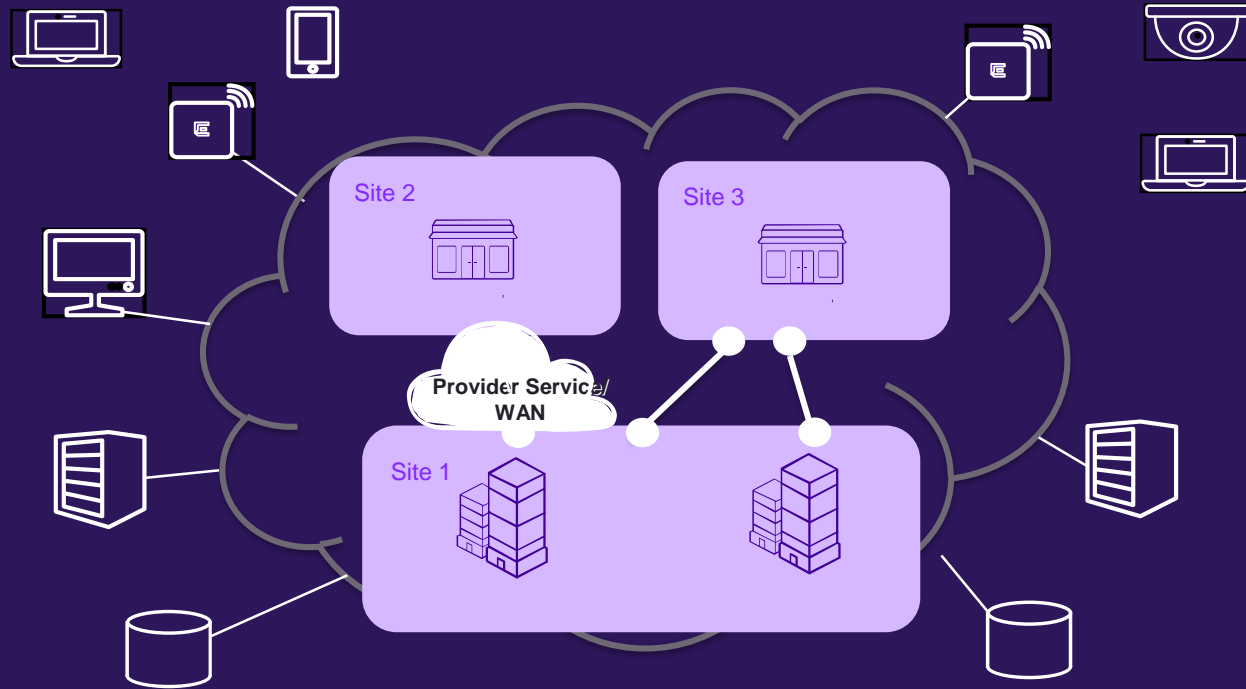
От классического подхода к построению сети



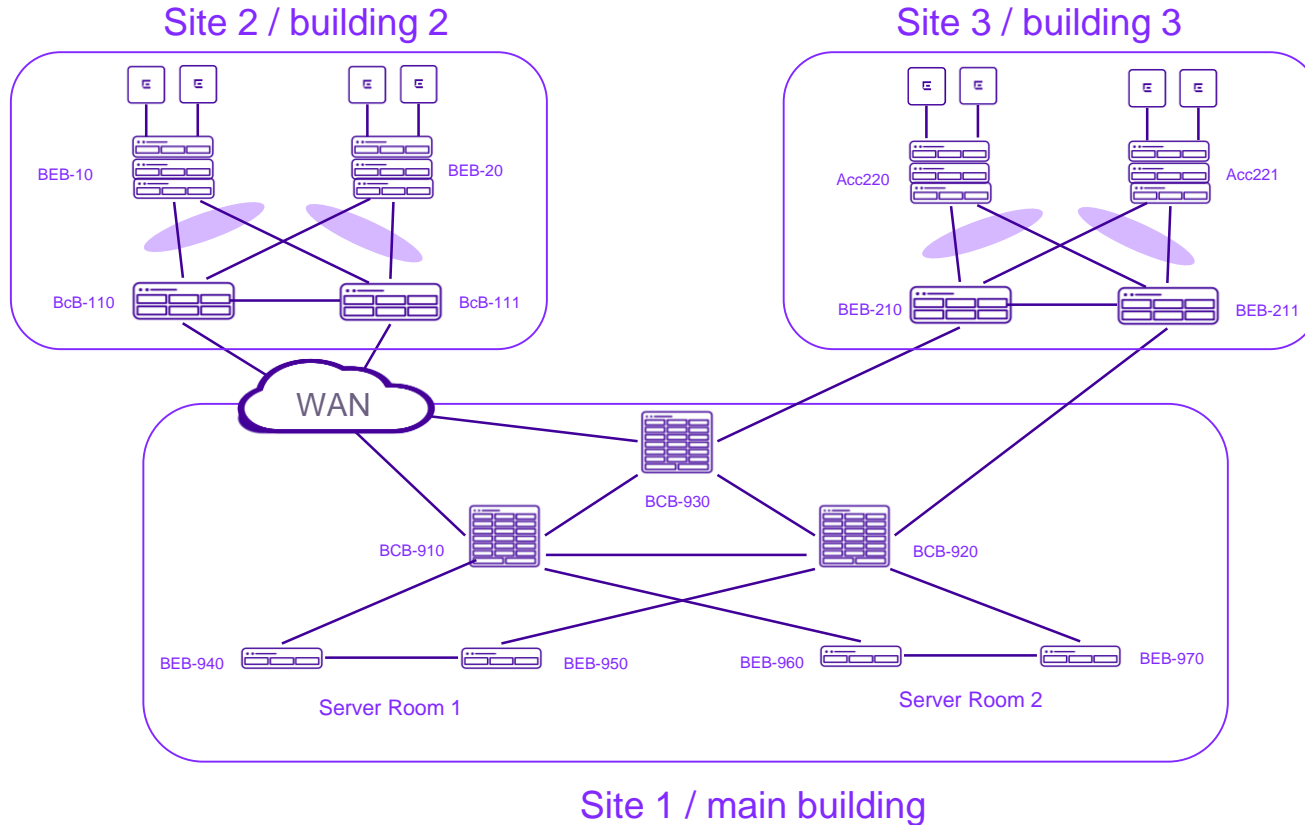
К новой концепции сетевой архитектуры



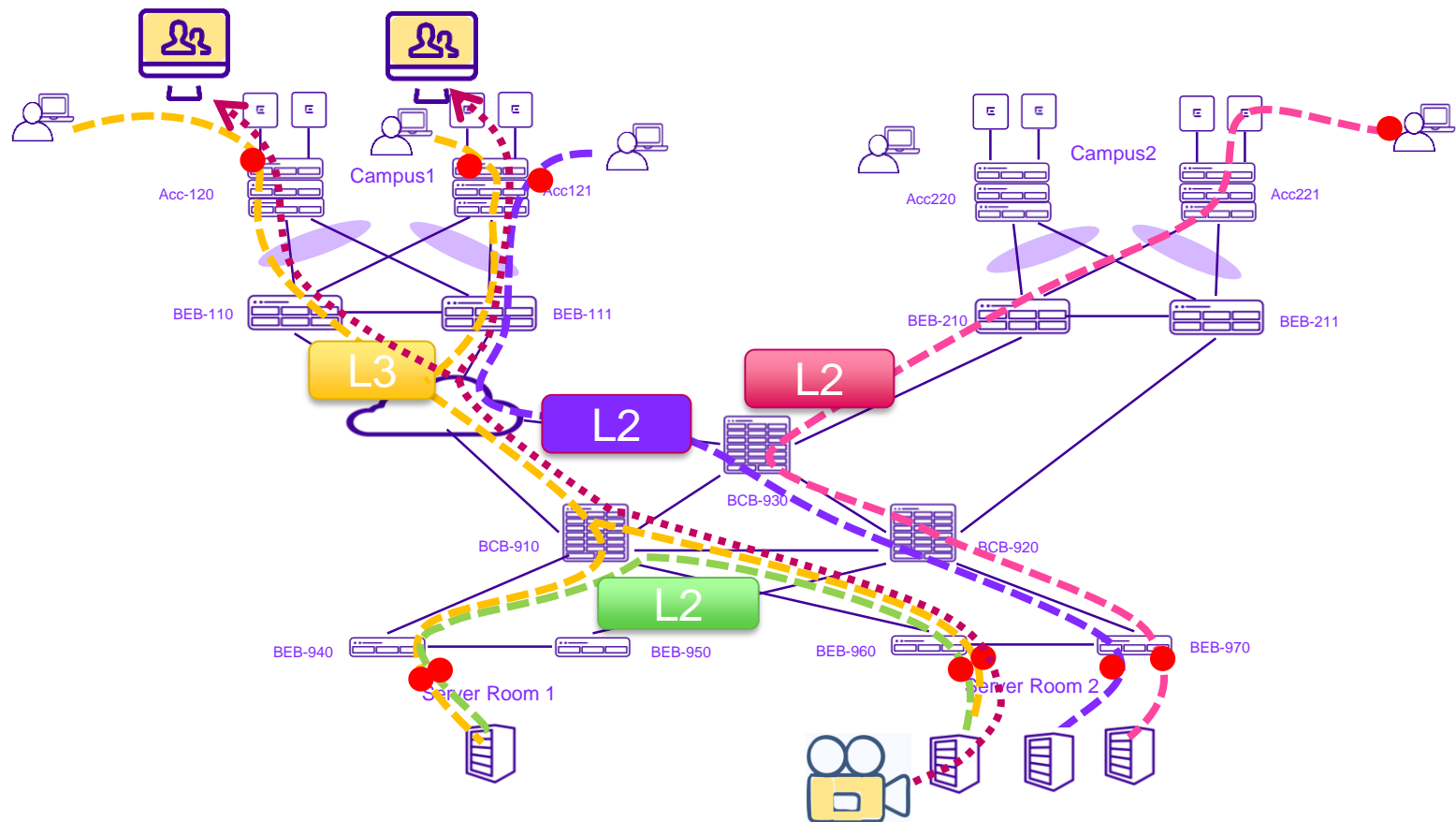
Пример корпоративной инфраструктуры



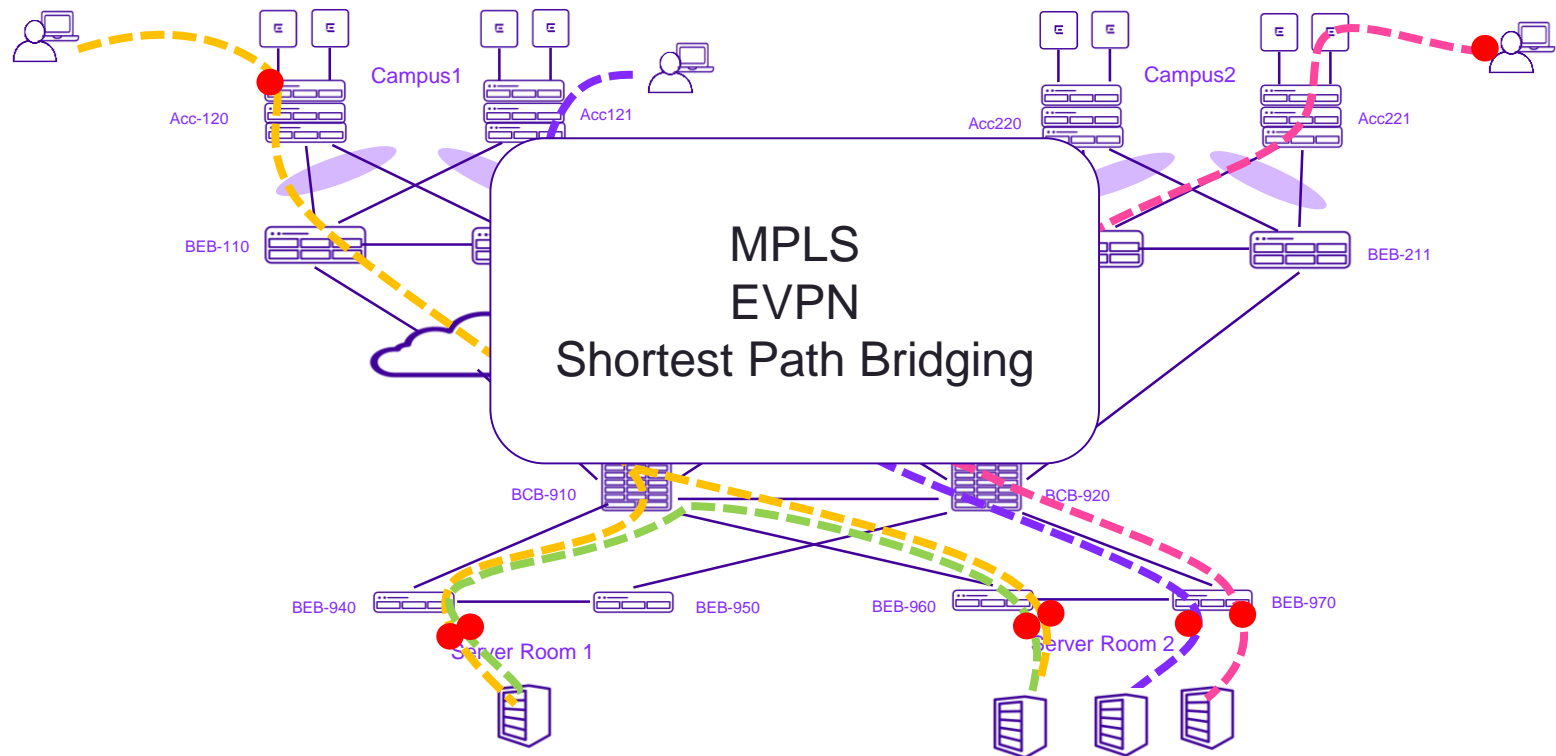
Пример корпоративной инфраструктуры



Организация L2 и L3 сервисов



Возможные альтернативы



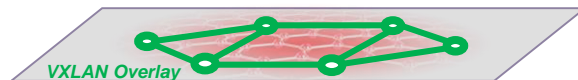
Сравнение различных подходов

EVPN over VXLAN



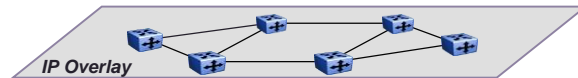
Service Signalling: **MP-BGP**

Encapsulation	Ethernet + IP + VXLAN	Overhead = 36B
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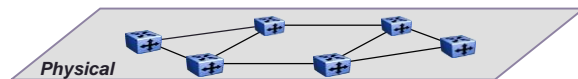
VXLAN Control Plane: **MP-BGP**

Encapsulation	Ethernet + IP	Overhead = 20B
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IP Control Plane: **OSPF or IS-IS(IP) or BGP**

Encapsulation	Ethernet	Overhead = 0B
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Сравнение различных подходов

EVPN over VXLAN

- *RFC 4271 "A Border Gateway Protocol 4"*
- *RFC 4364 "BGP/MPLS IP Virtual Private Networks (VPNs)"*
- *RFC 4760 "Multiprotocol Extensions for BGP-4"*
- *RFC 7348 "Virtual eXtensible Local Area Network (VXLAN)"*
- *RFC 7432 "BGP MPLS-Based Ethernet VPN"*
- *RFC 7938 "Use of BGP for Routing in Large-Scale Data Centers"*
- *RFC 8300 "Network Service Header (NSH)"*
- *RFC 8365 "A Network Virtualization Overlay Solution Using Ethernet VPN (EVPN)"*
- *draft-ietf-bess-evpn-prefix-advertisement-11*
- *draft-ietf-bess-evpn-inter-subnet-forwarding-05*

Cisco:

- *Locator/ID Separation Protocol (LISP) VXLAN control plane*
- *EIGRP or OSPF IP control plane*
- *And Cisco TrustSec*

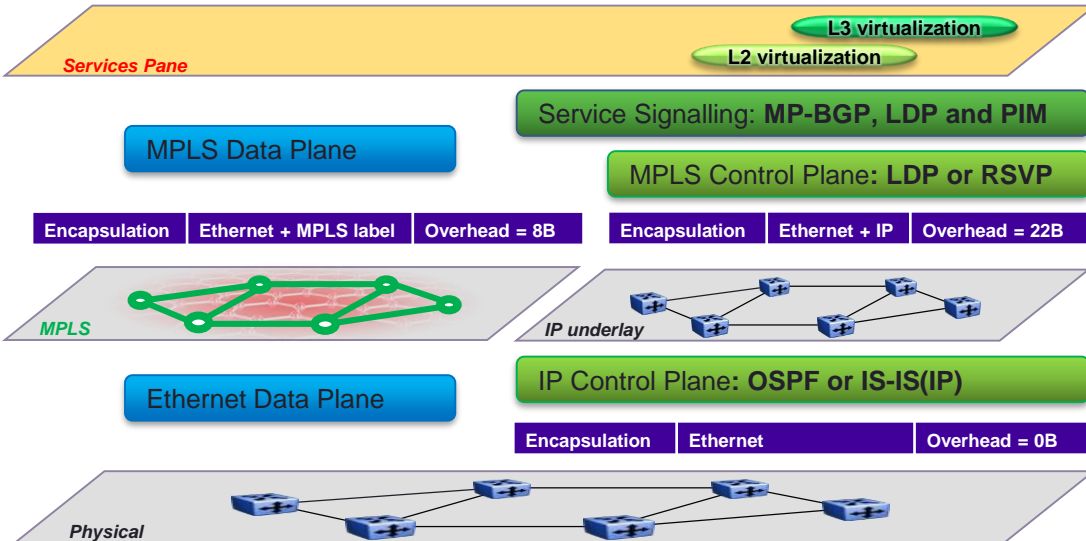
Extreme Fabric Connect

- *IEEE 802.1Q-2014 (clause 27 & 28)*
- *Layer 3 virtualization & IP MC: Privat IS-IS TLV (ext. 184, 185 og 186)*

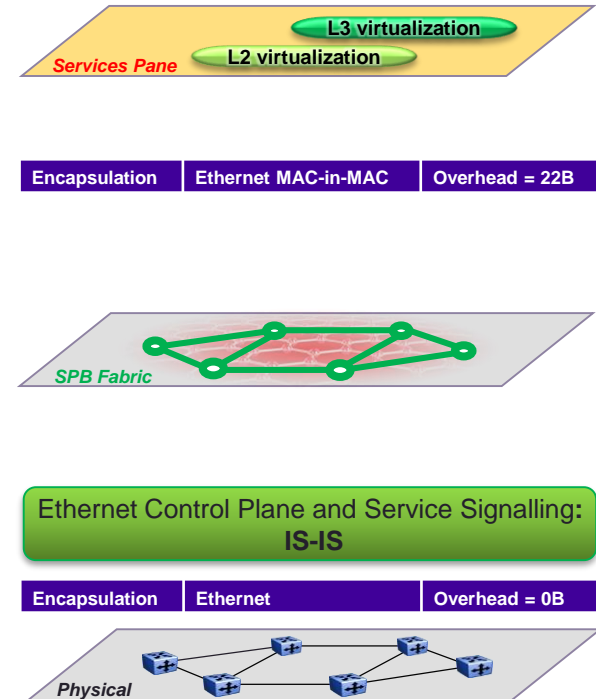


Сравнение различных подходов

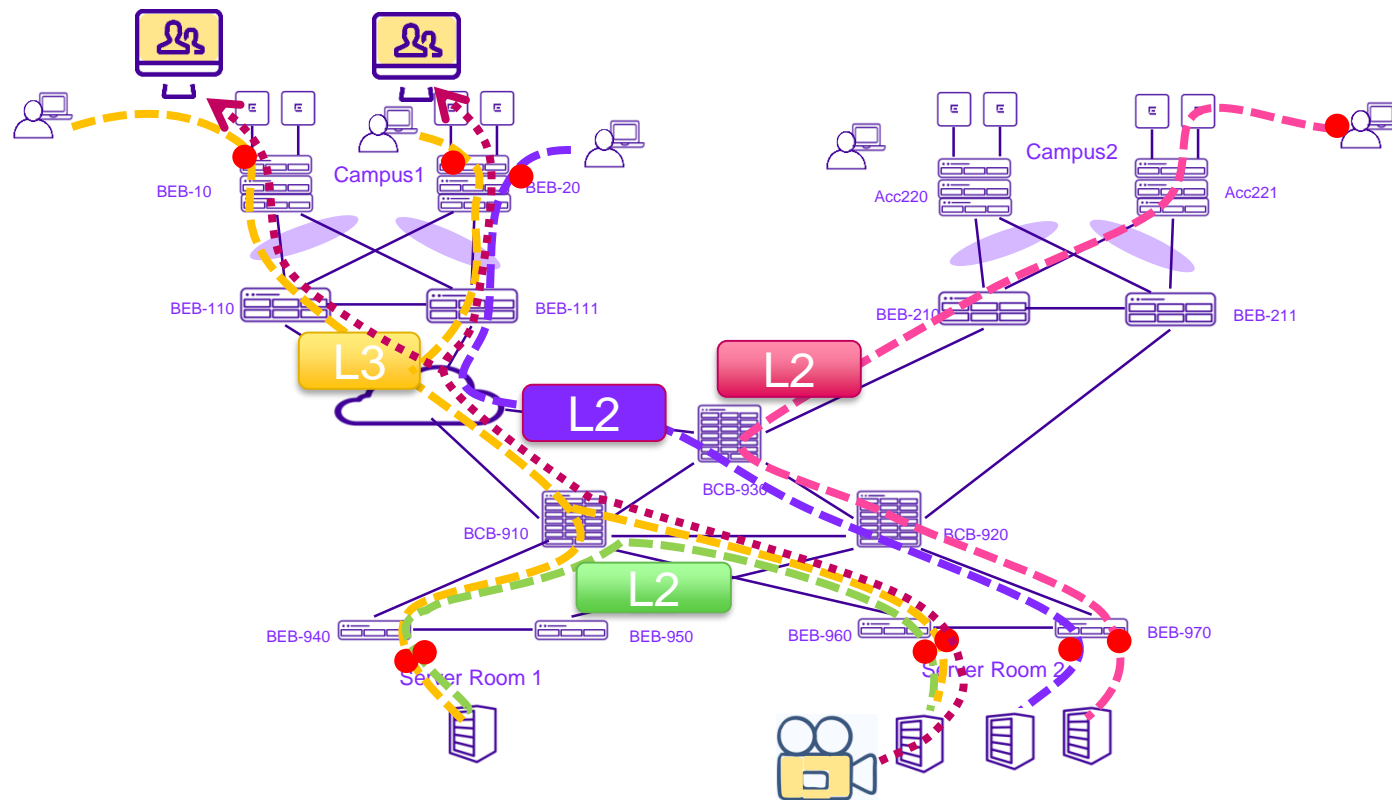
MPLS backbone



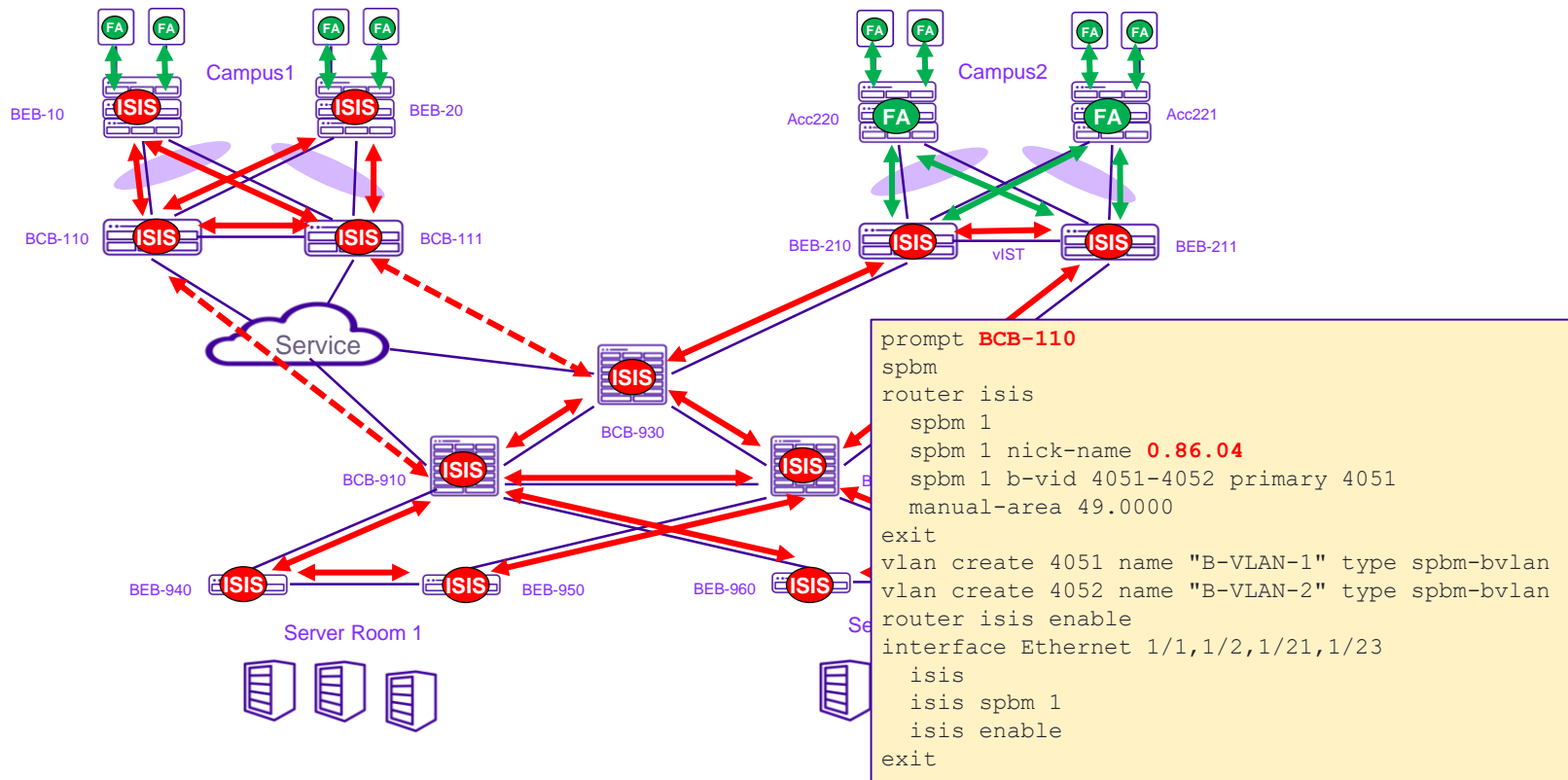
Extreme Fabric Connect / SPB



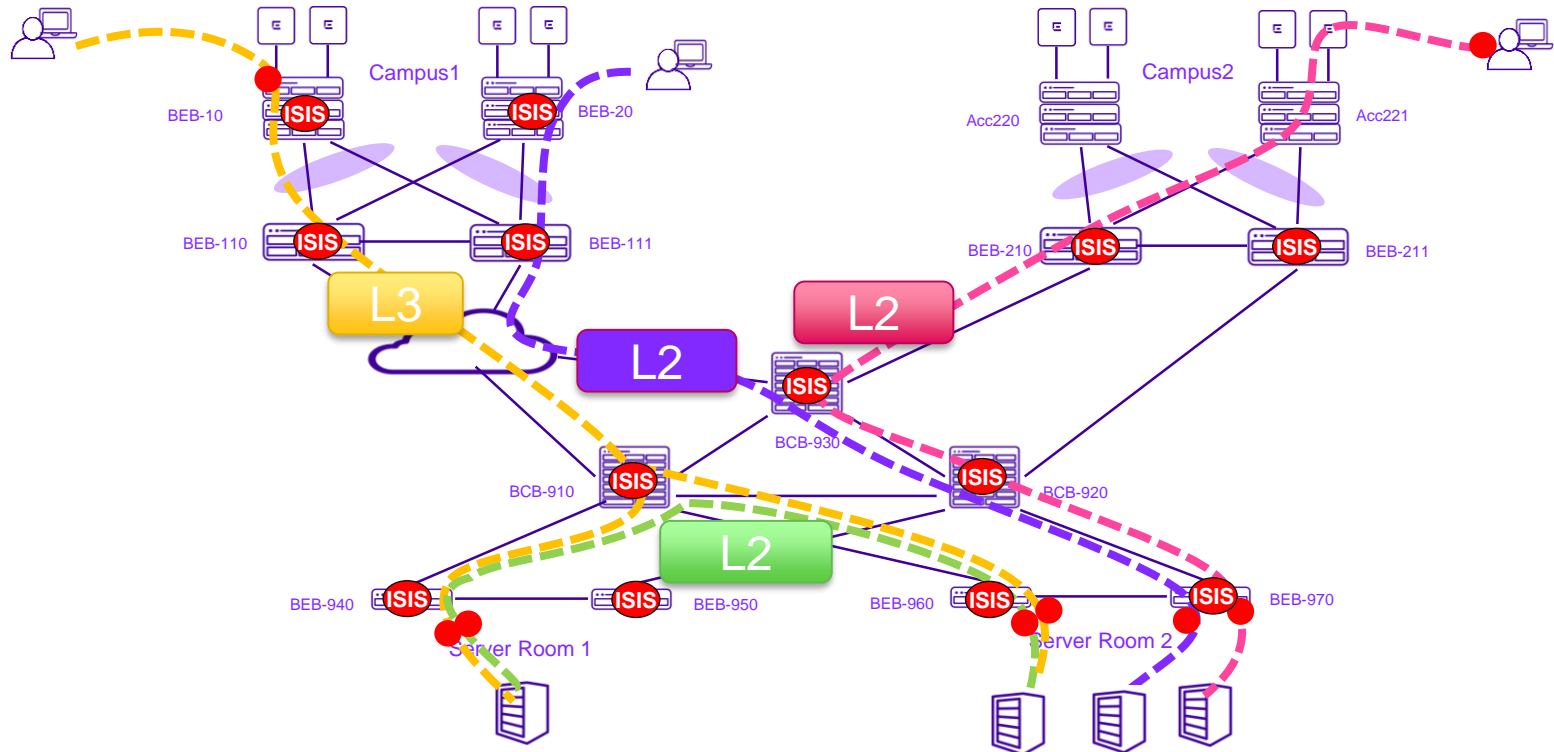
Shortest Path Bridging как основа Extreme Fabric Connect



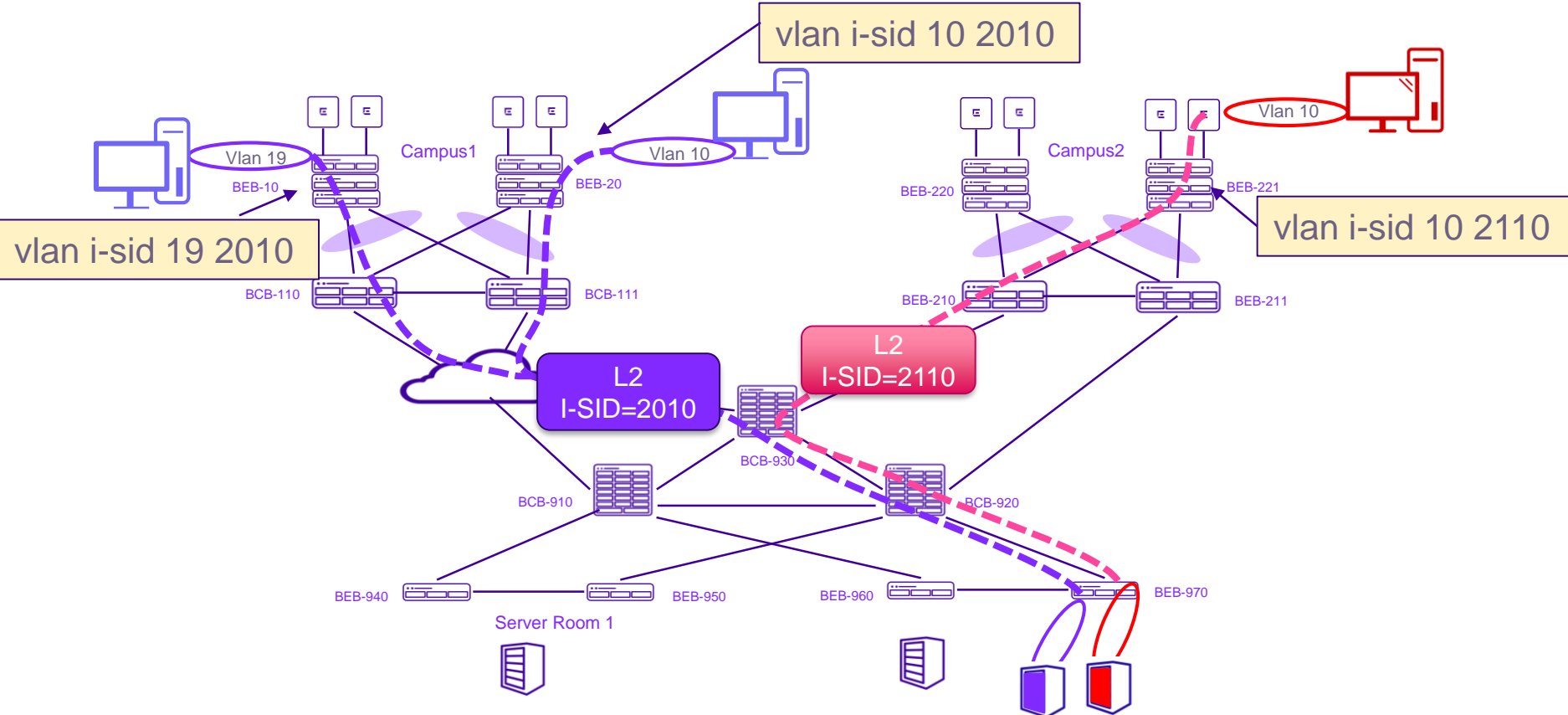
Как настраивается Extreme Fabric Connect



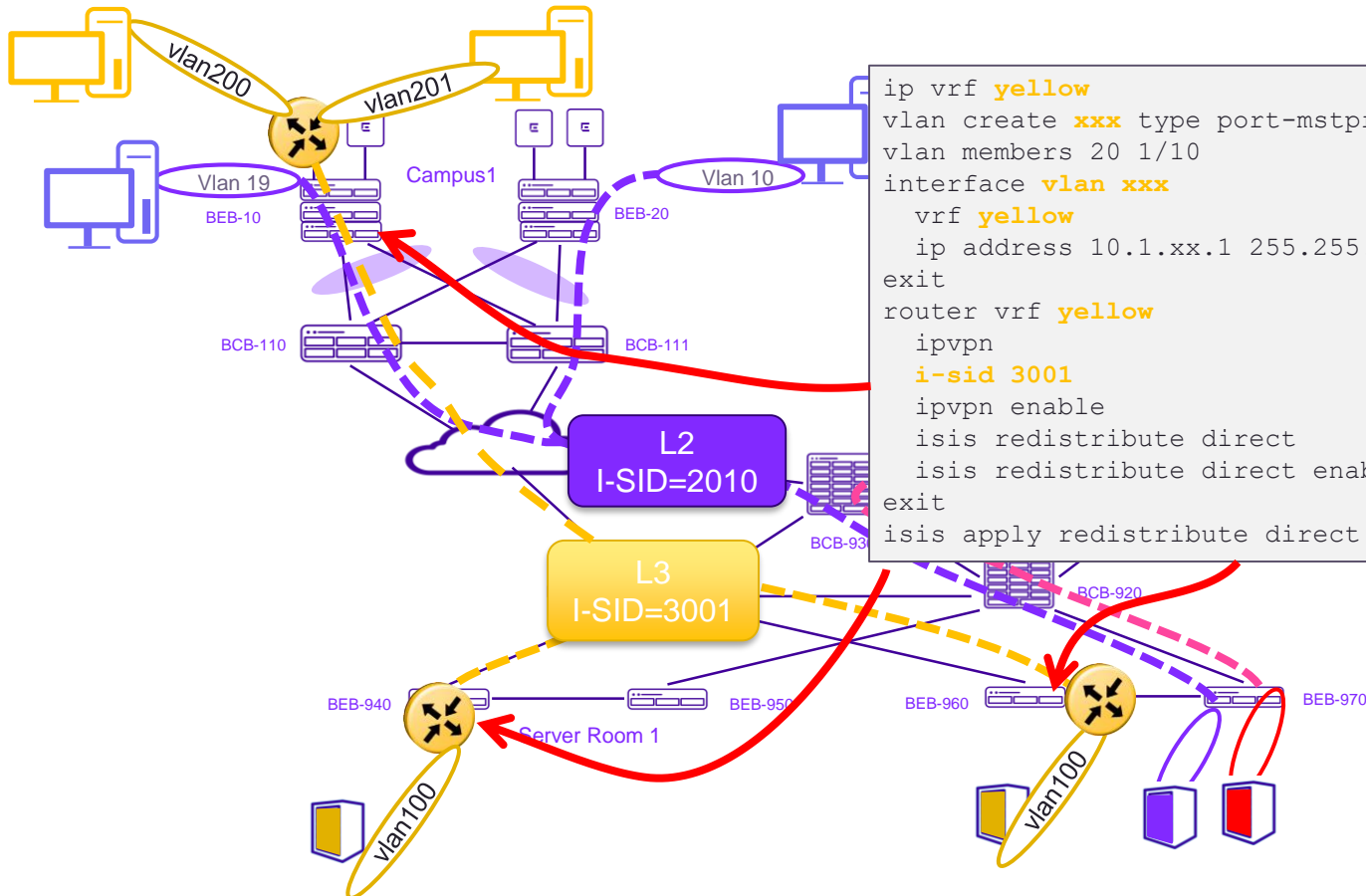
Как работает Fabric Connect



Создание L2 сервисов



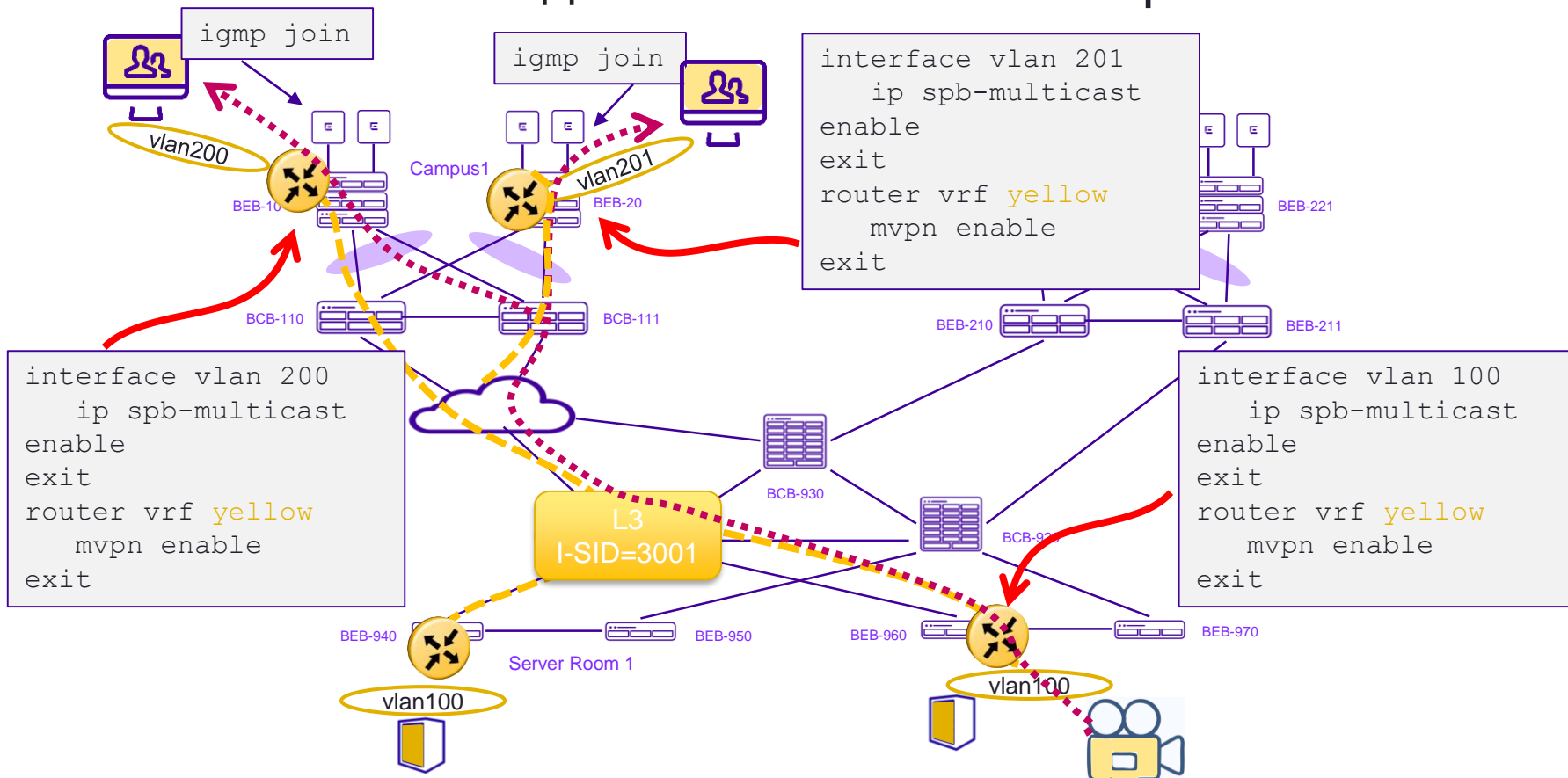
Создание L3 сервисов



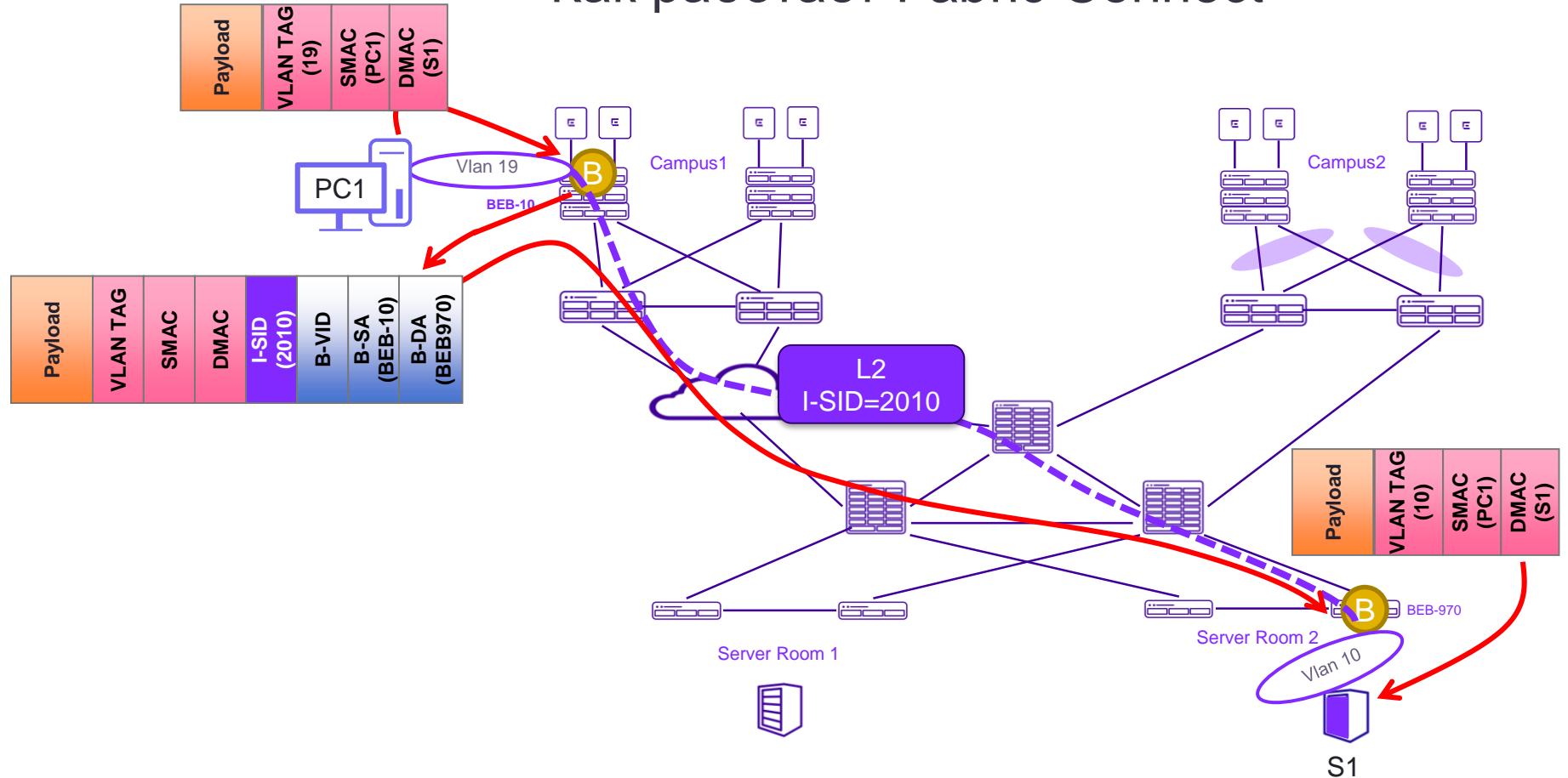
```
ip vrf yellow
vlan create xxx type port-mstprstp 0
vlan members 20 1/10
interface vlan xxx
  vrf yellow
  ip address 10.1.xx.1 255.255.255.0
exit
router vrf yellow
  ipvpn
  i-sid 3001
  ipvpn enable
  isis redistribute direct
  isis redistribute direct enable
exit
isis apply redistribute direct vrf yellow
```



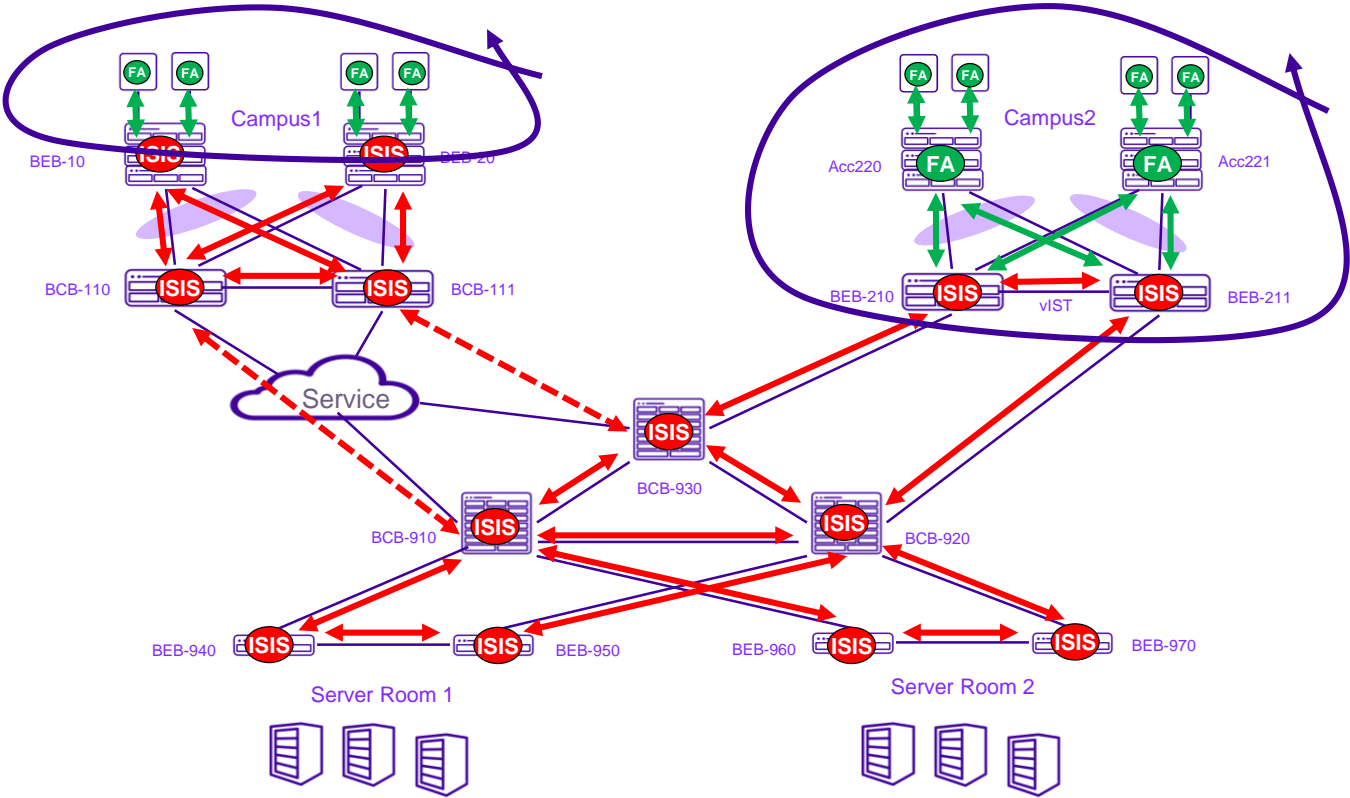
Подключение Multicast сервиса



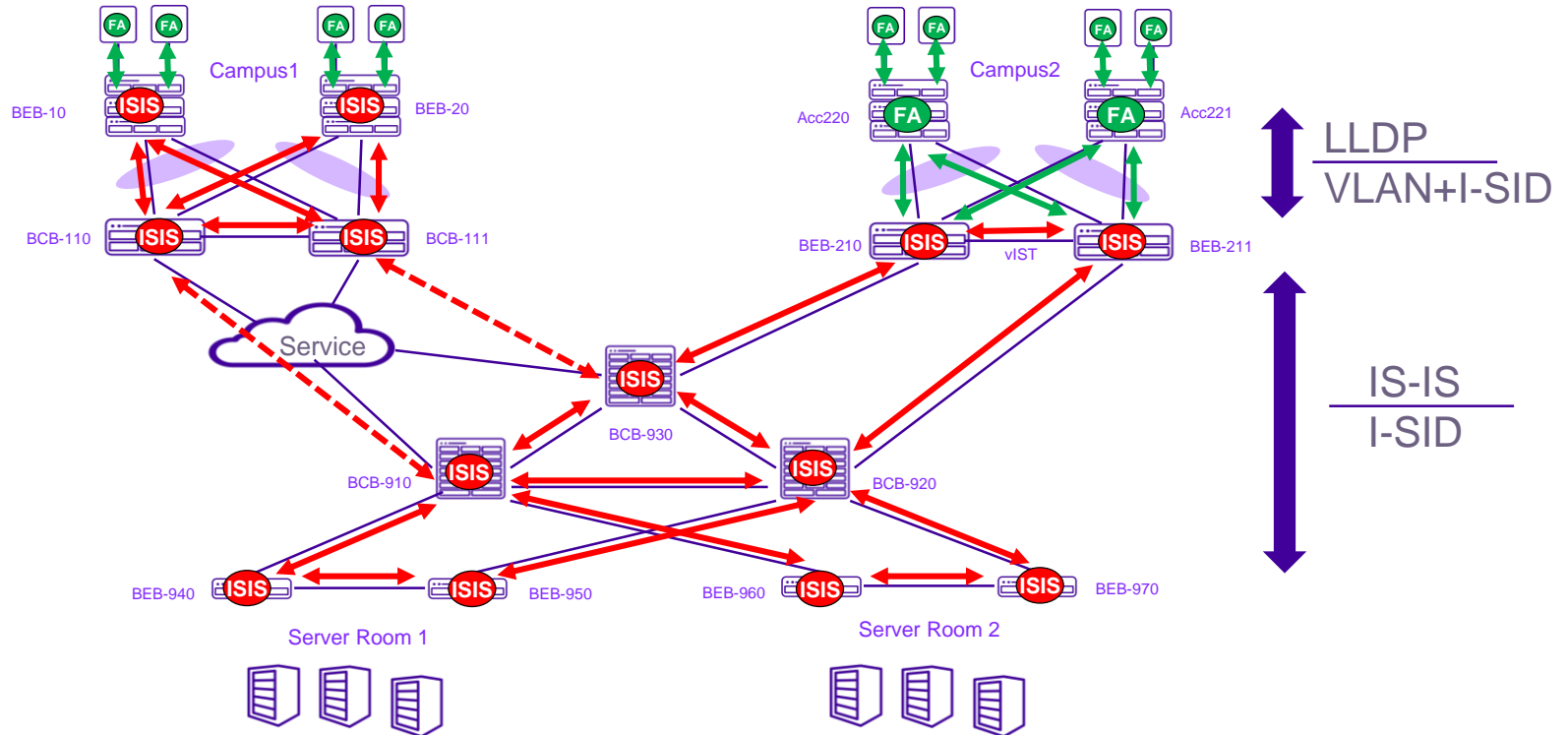
Как работает Fabric Connect



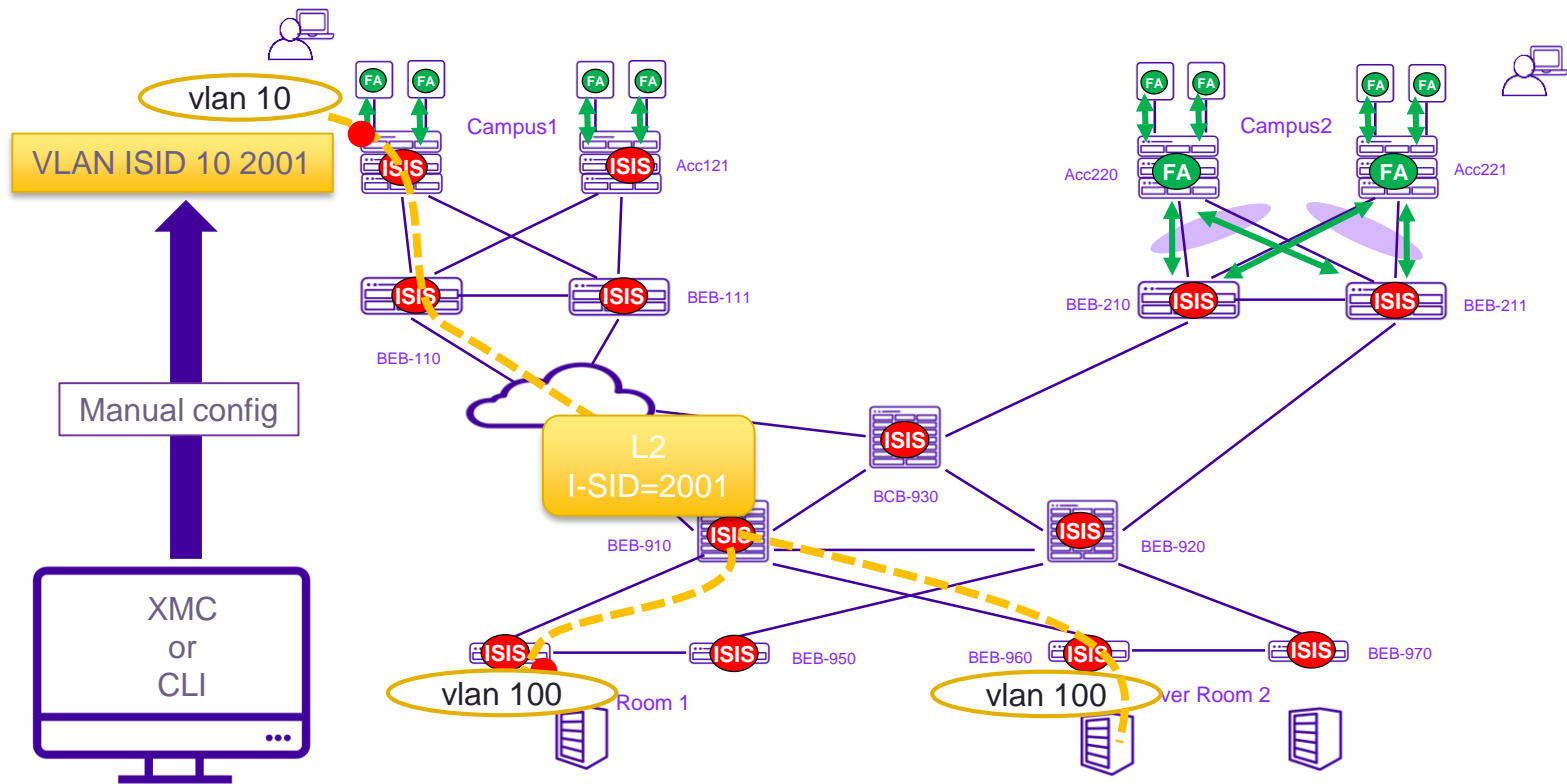
Автоматизация на уровне доступа



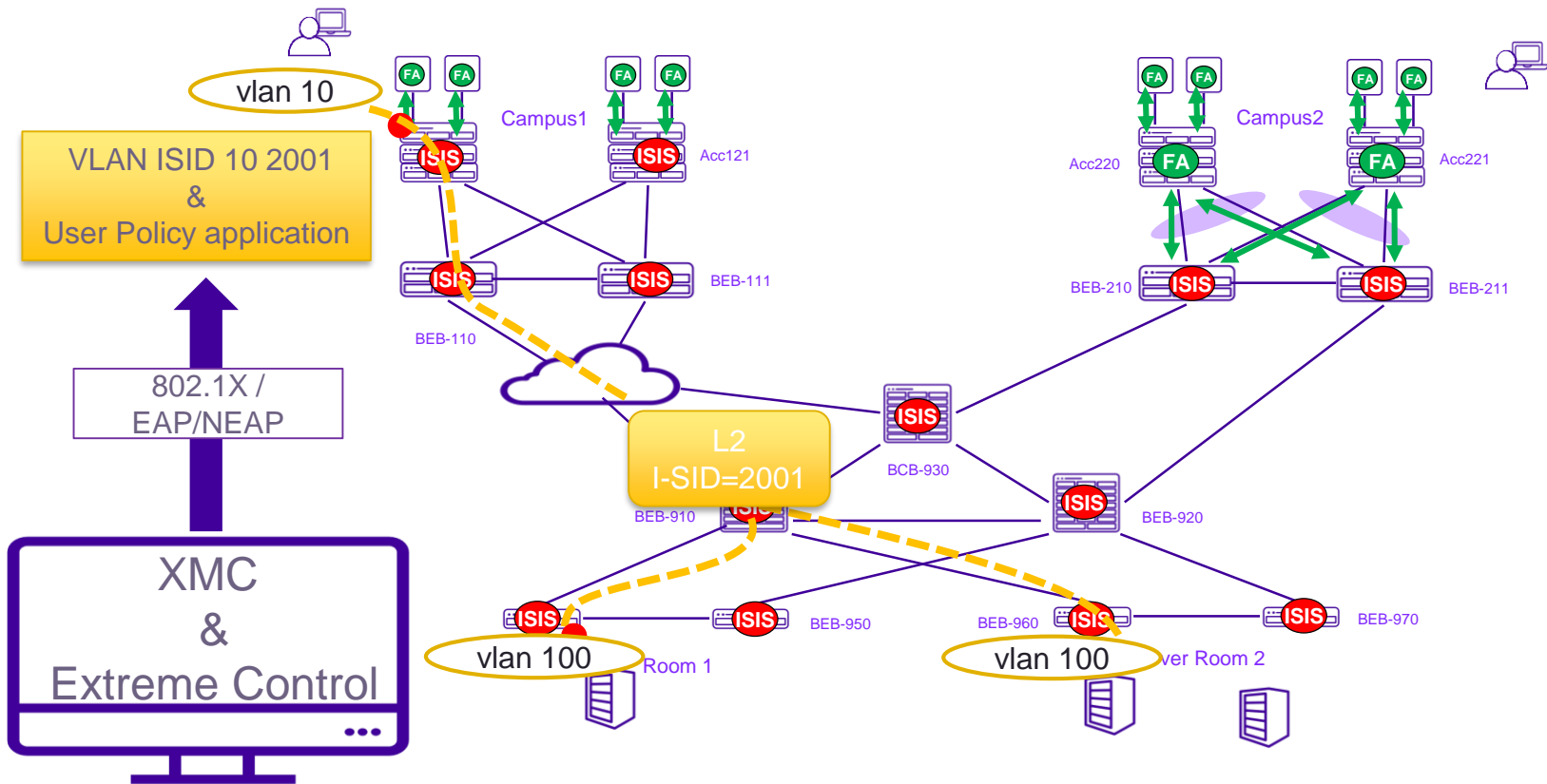
Технология для уровня доступа - Fabric Attach



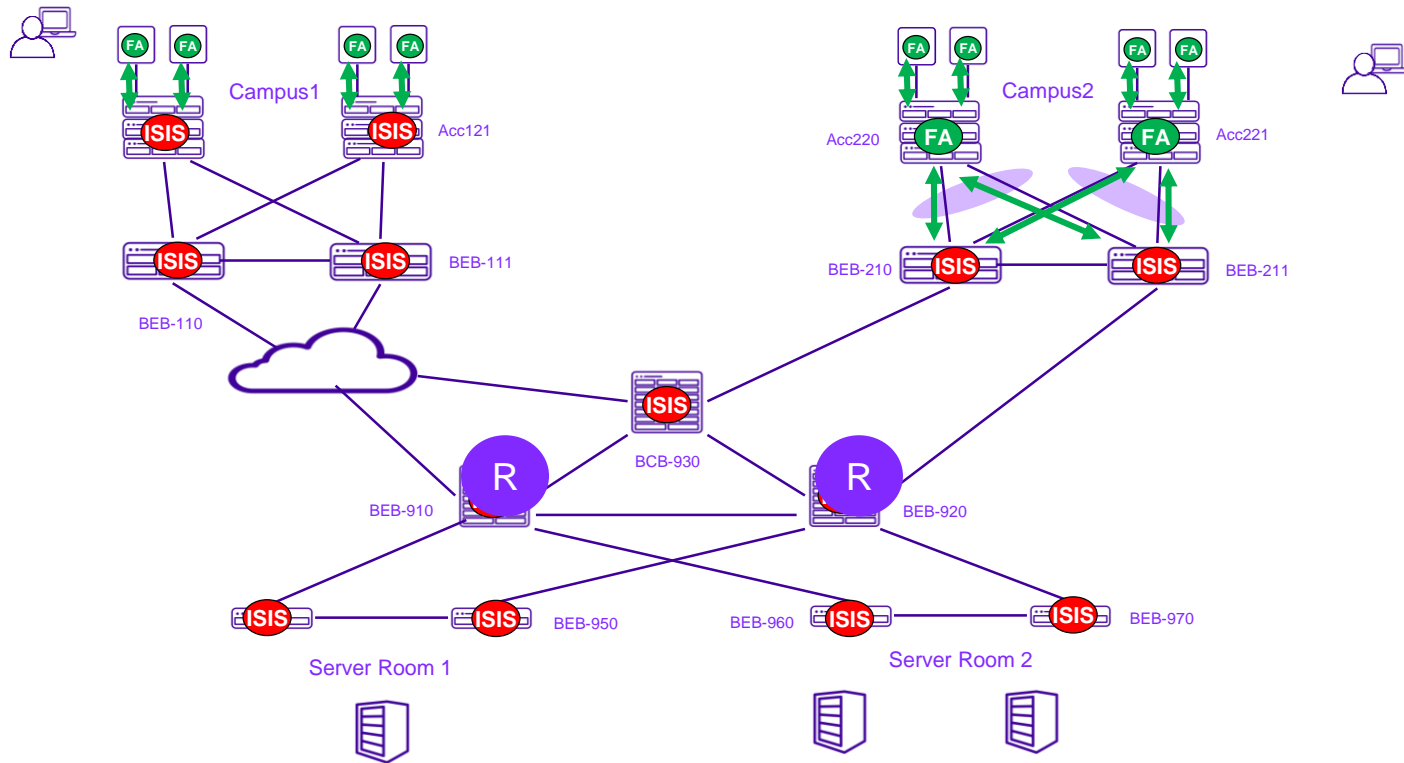
Настройка уровня доступа в ручном режиме



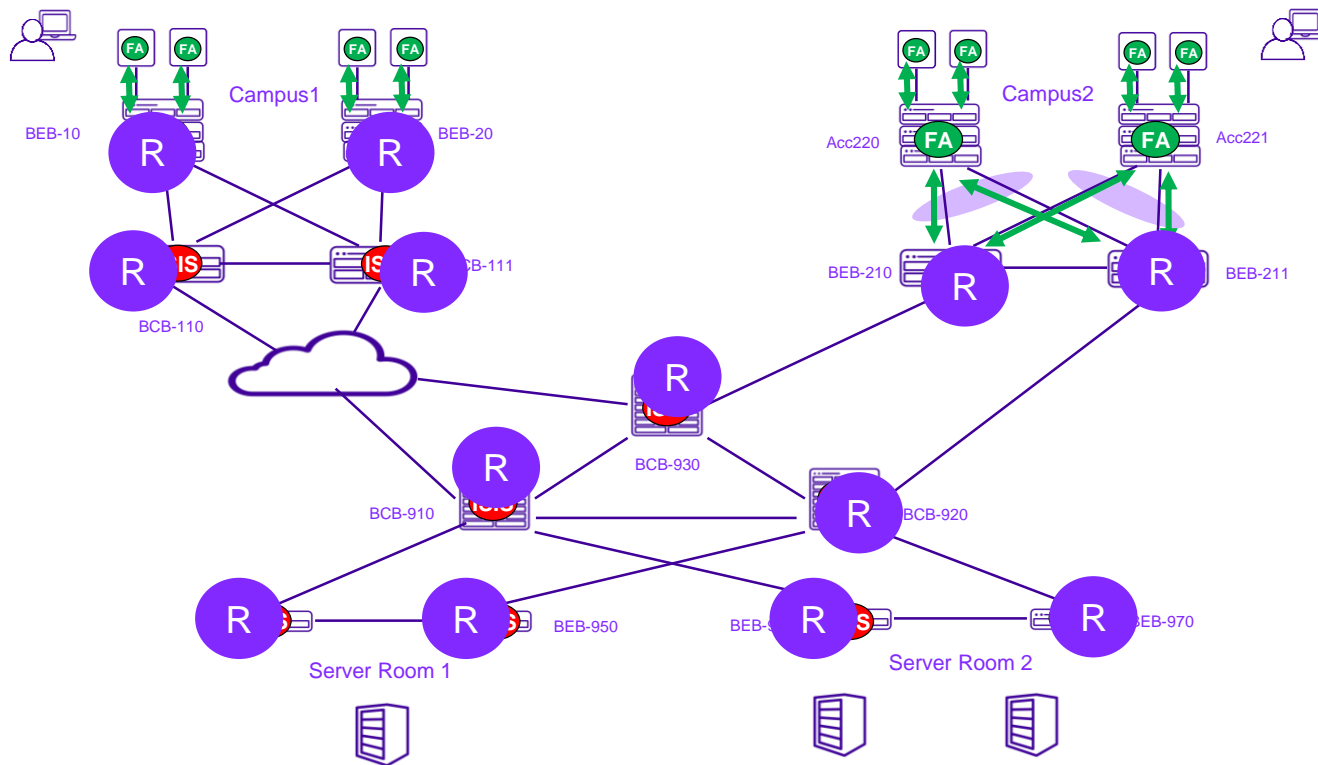
Автоматизированная настройка



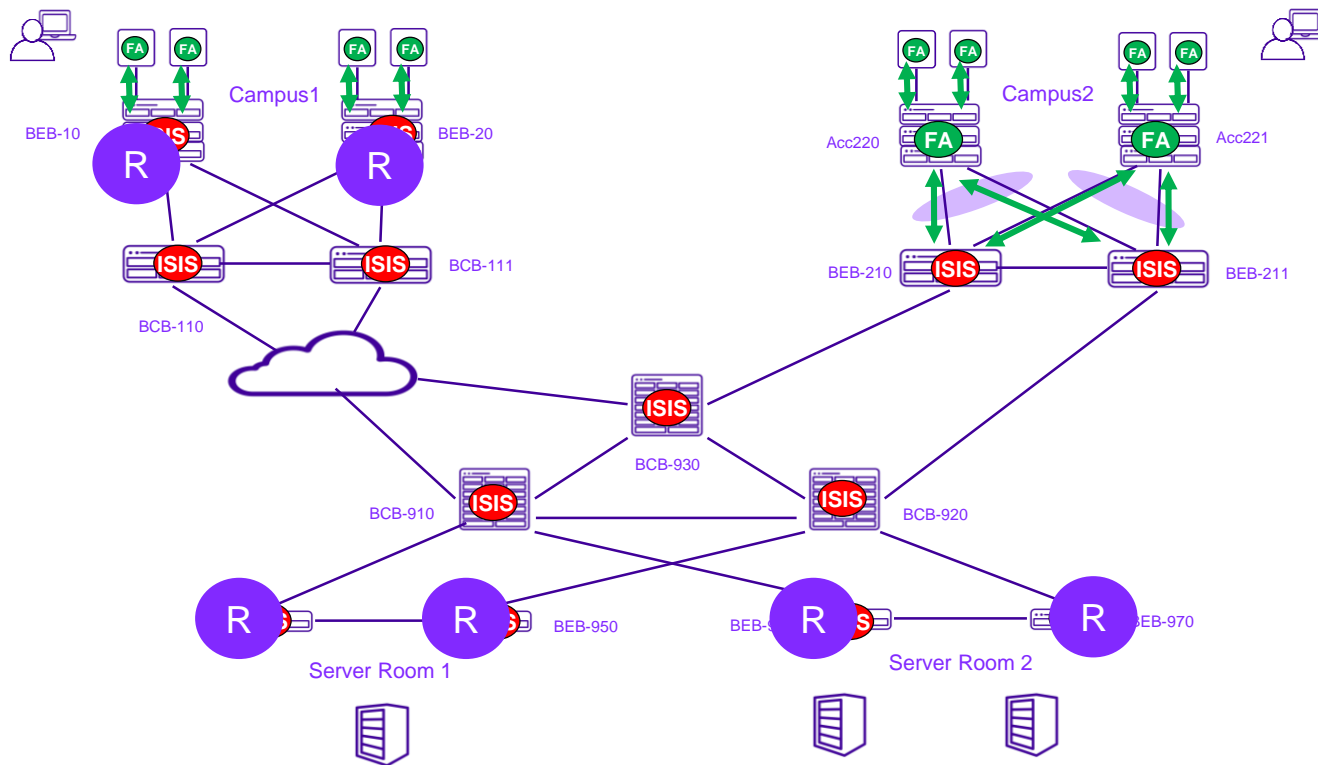
Централизованная маршрутизация



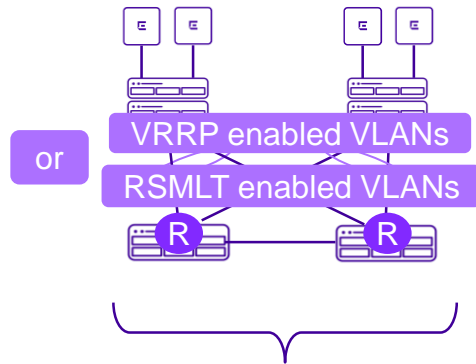
Распределенная маршрутизация



Маршрутизация в любом месте

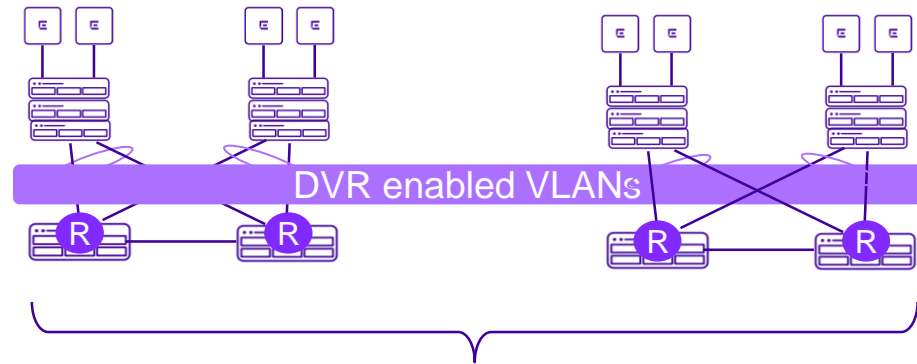


Резервирование шлюза в L2 сегментах



Use if Subnet is only connected to pair of nodes

RSMLT = Routed "MLAG"

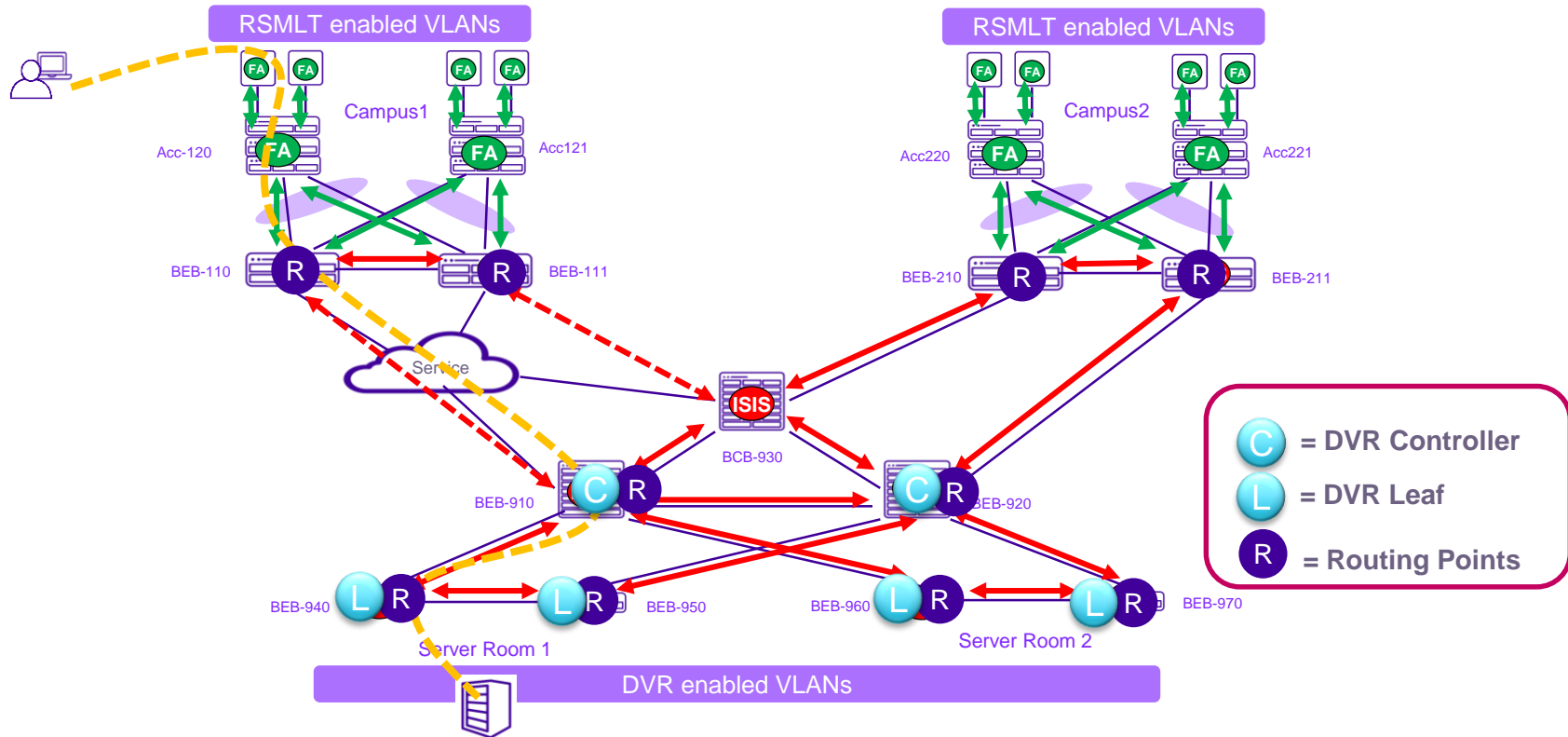


Use if Subnet is stretched across network (e.g. data center)

DVR = Distributed Virtual Routing

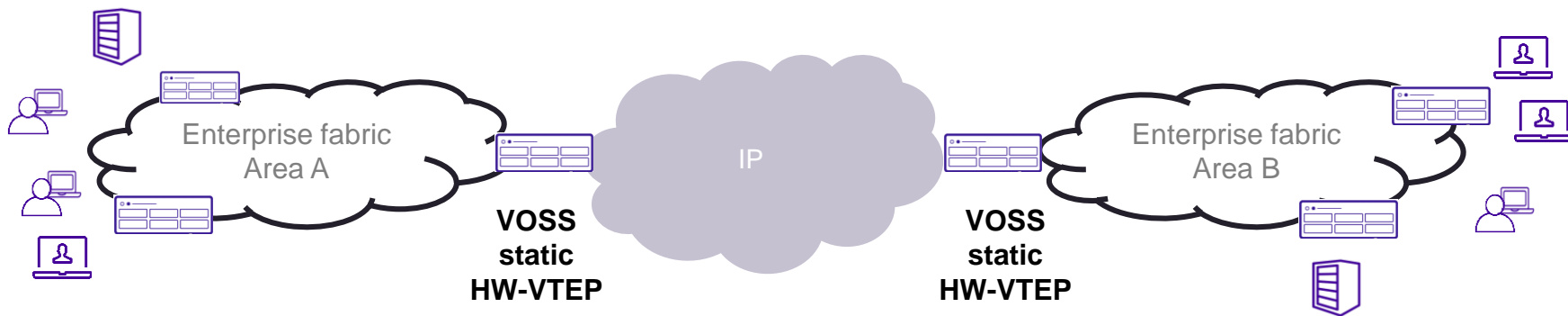


Distributed Virtual Routing

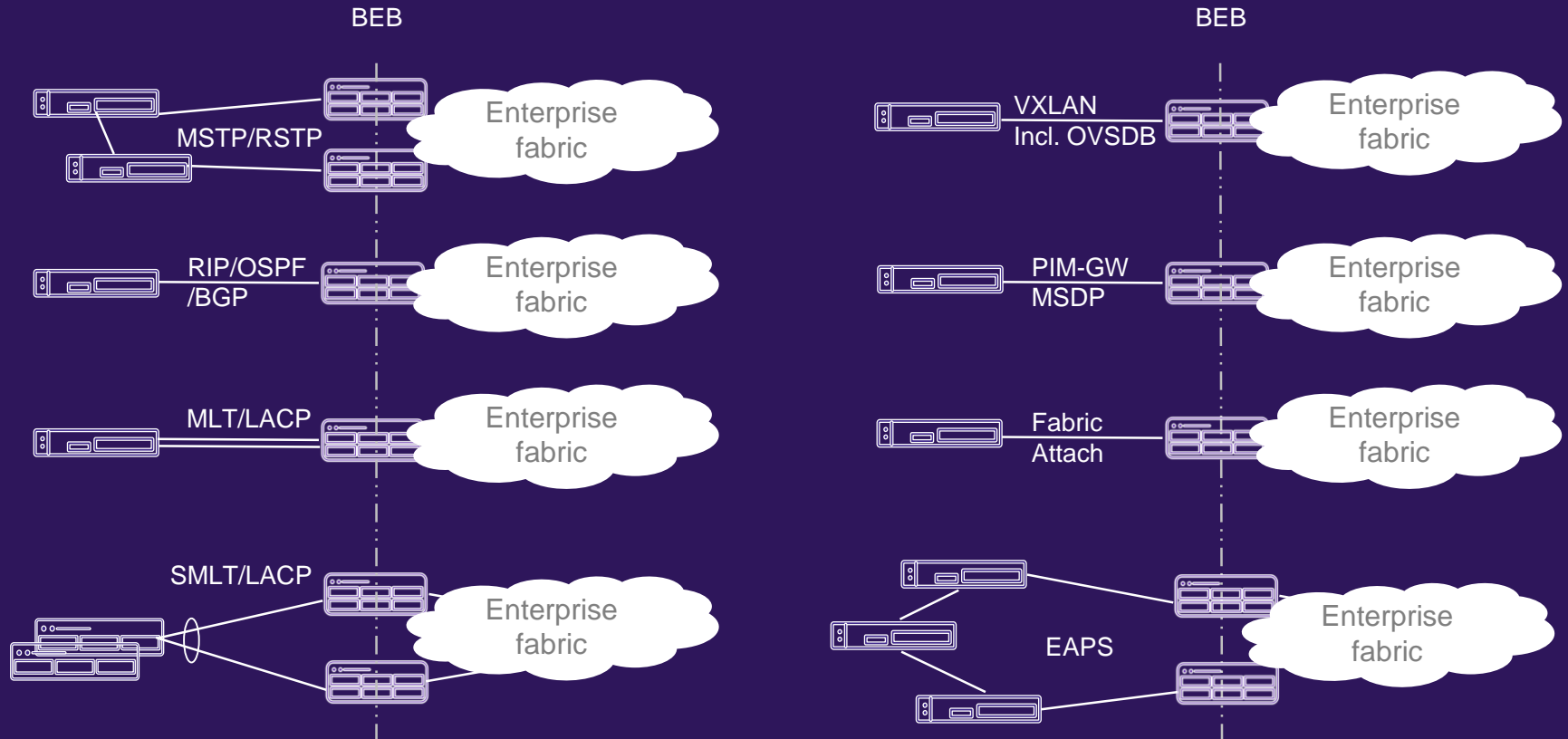


Связь между удаленными сегментами

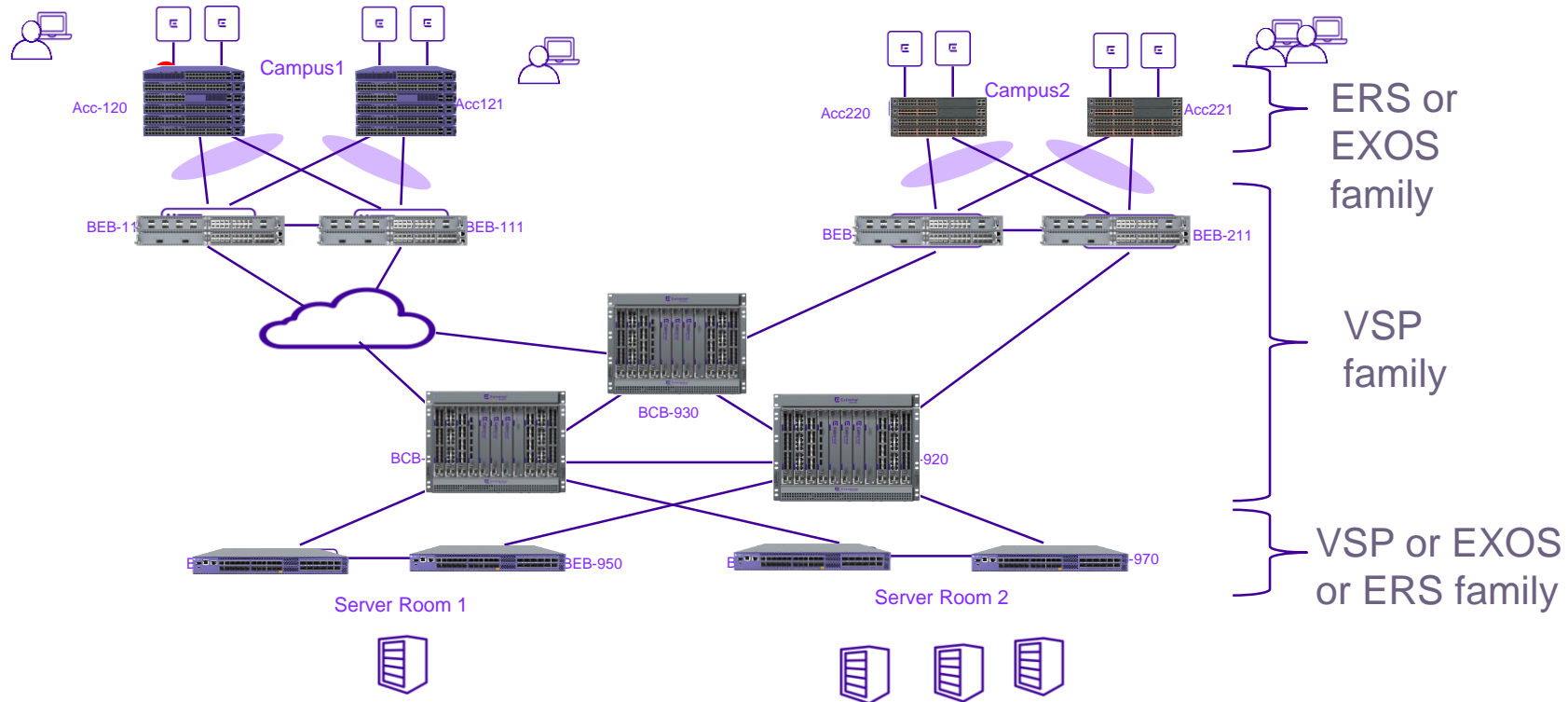
Fabric Connect areas interconnect using VXLAN Gateway function



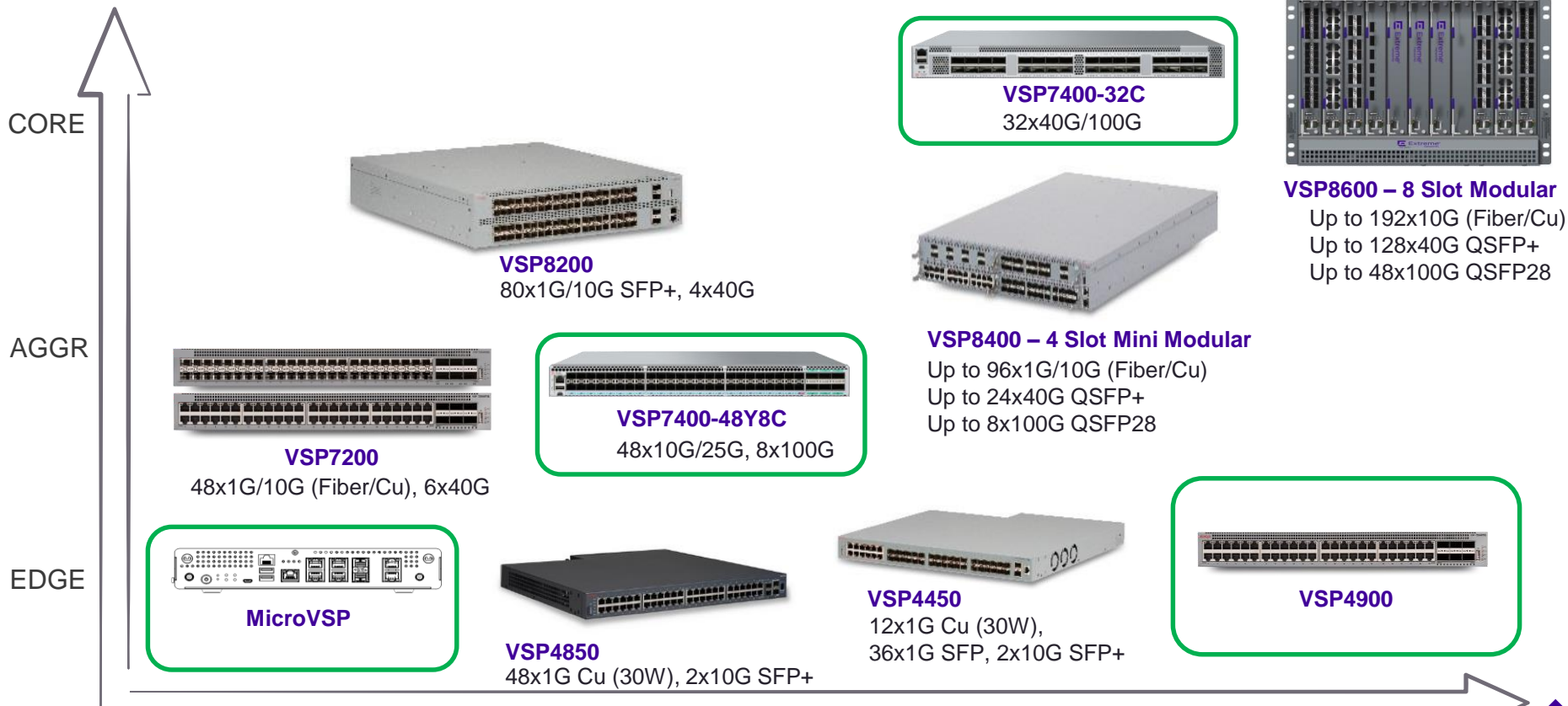
Интеграция с другими технологиями



Оборудование для построения Fabric Connect



Коммутаторы семейства VSP



Коммутаторы для уровня доступа



ERS3600
1G/10G



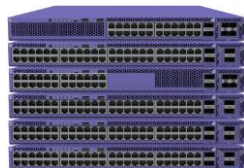
X440-G2
1G/10G



X450
1G/10G



ERS4900
1G/10G
SPB



X465
1G/25G/40G



ERS5900
1G/2,5G/10G
SPB



X670
1G/40G



X590
10G/25G/40G/50G/100G



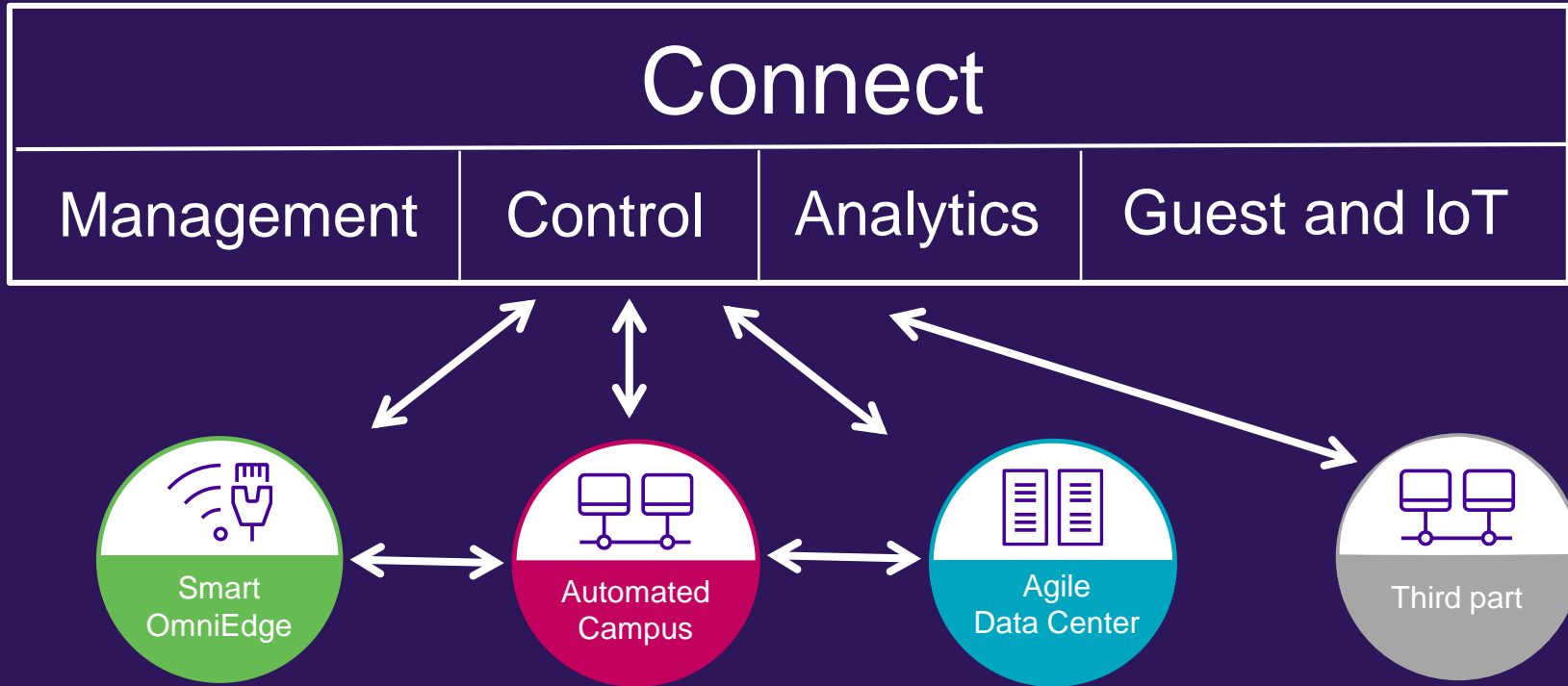
X670
10G/40G/100G



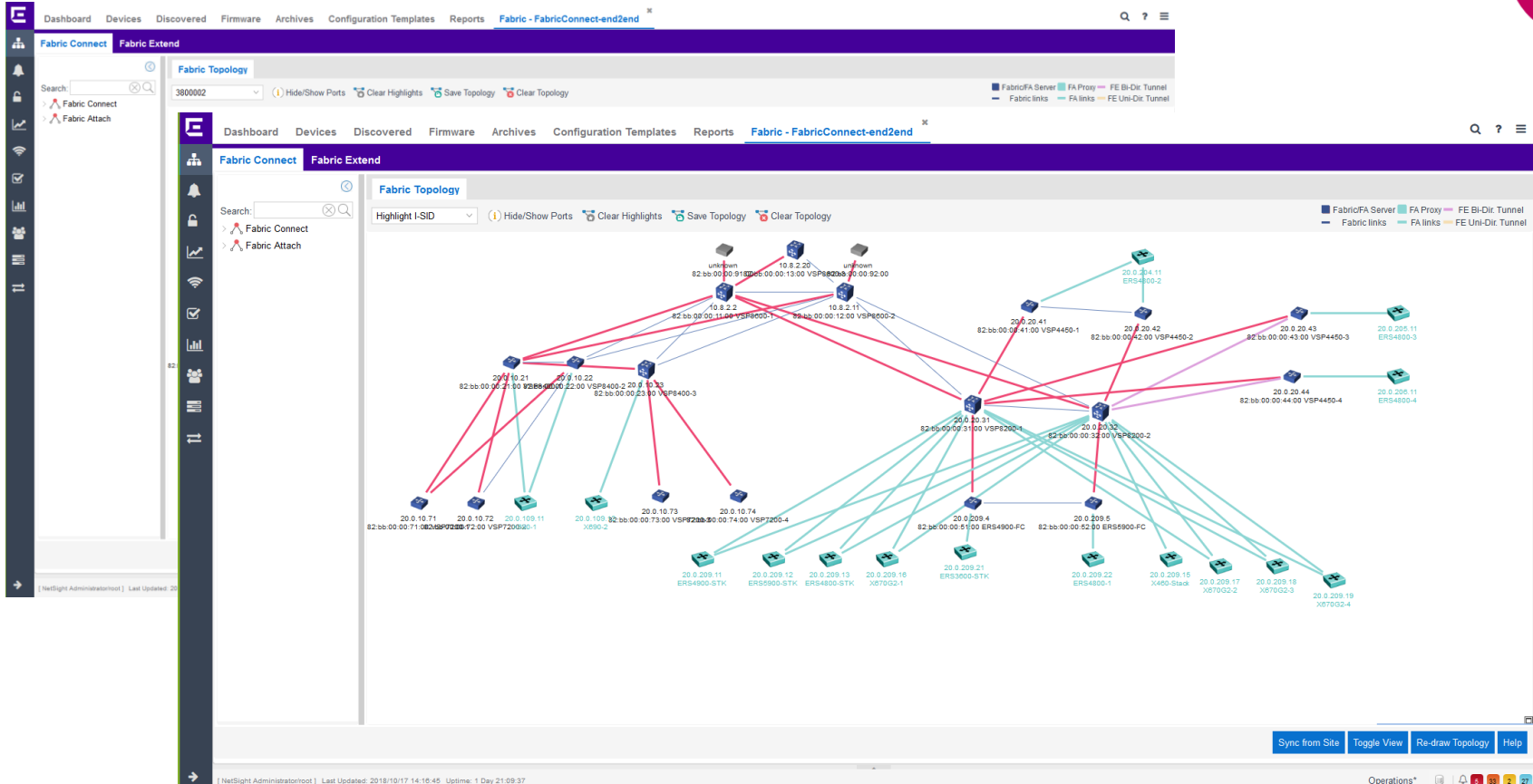
X870
10G/40G/100G



Extreme Management Center



ХМС Fabric Manager для визуализации



Extreme Fabric Connect

Service Features:

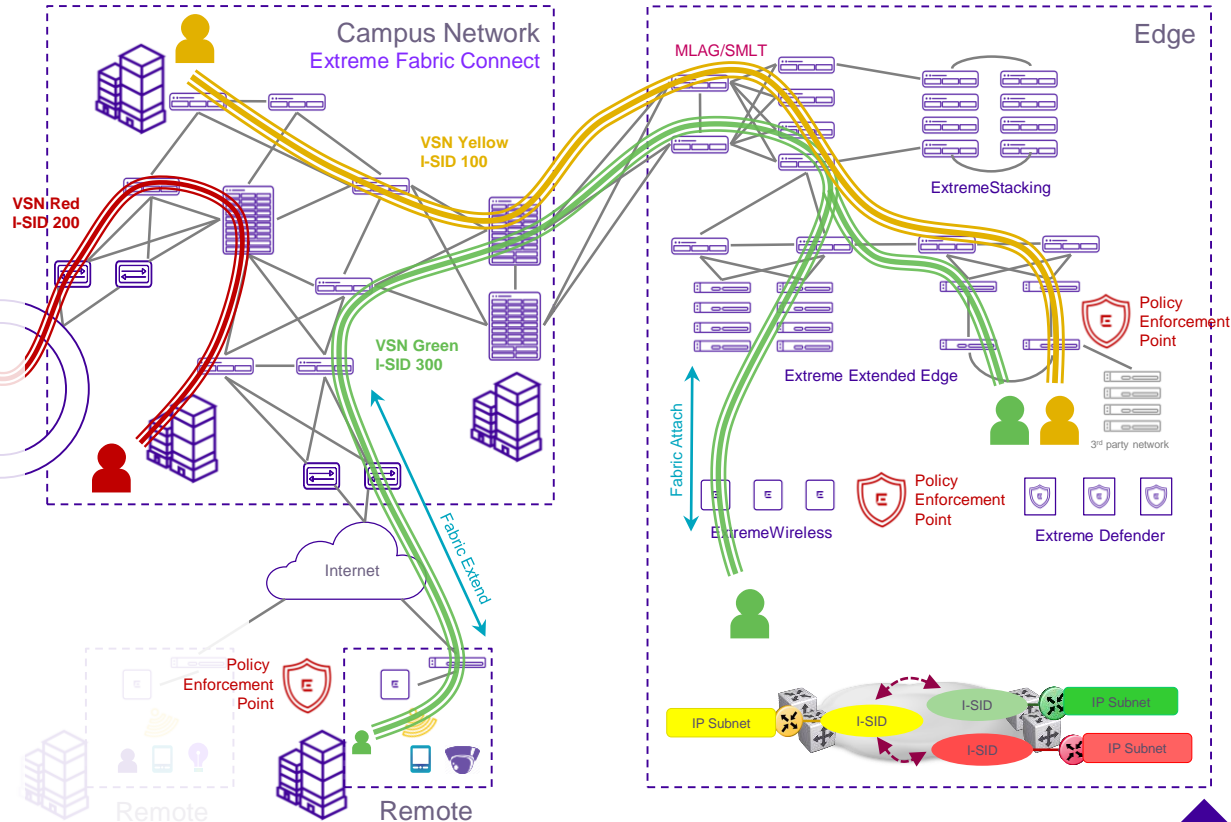
- L2 and L3 VPN services
- Mixed L2/L3
- Inter-VSN Routing
- Native multicast support
- Integrated OAM/CFM
- Fabric extension over IP

Security:

- Hyper-segmentation (zoning)
- Stealth infrastructure
- Policy-based dynamic profiles

Service Auto-Provisioning:

- Edge-only provisioning
- Network Access Control integration
- Service assignment on non-fabric devices (Fabric Attach)





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