



**NET  
MAKERS**

# ECMWF data centre migration from UK to Italy

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ECMWF

# European Centre for Medium-Range Weather Forecasts

Established in 1975

- 23 member states
- 12 cooperating states
- About 430 staff from over 35 countries

Produces global Numerical Weather Predictions (NWP)

- A 24/7 operational service and a research institute
- Headquarters in Reading (UK)
- Sites in Bologna (Italy) and Bonn (Germany)

Has one of the largest supercomputing facilities and meteorological archives in the world

- Multiple Top 500 list supercomputers
- Data archive of approximately 600PB
- Disseminate tens of Terabytes of data daily

# Migration of Data Centre to Italy

ECMWF's data centre has been in Reading for over 40 years

ECMWF's next supercomputers should provide a tenfold increase in computational capacity

The current facility does not offer the required flexibility for future growth

New data centre location decided based on an international bidding process

# New Network and Security Infrastructure Design

IP Fabric  
Architecture  
(Leaf-Spine)

Multi-site  
Topology  
(Hall Blueprint)

An opportunity to  
make a change

Branch Office  
Architecture

Security Layer  
Approach

# Technical Migration challenges

Long-distance transfers – effects of packet loss and latency on throughput

WAN emulator testing

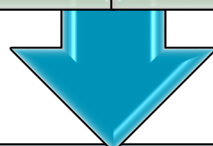
100Gbit bandwidth tests and kernel tuning to establish a performance baseline



Complex data flows

Application owners are not network engineers – data flows not always clear

Complex inter-site routing topology

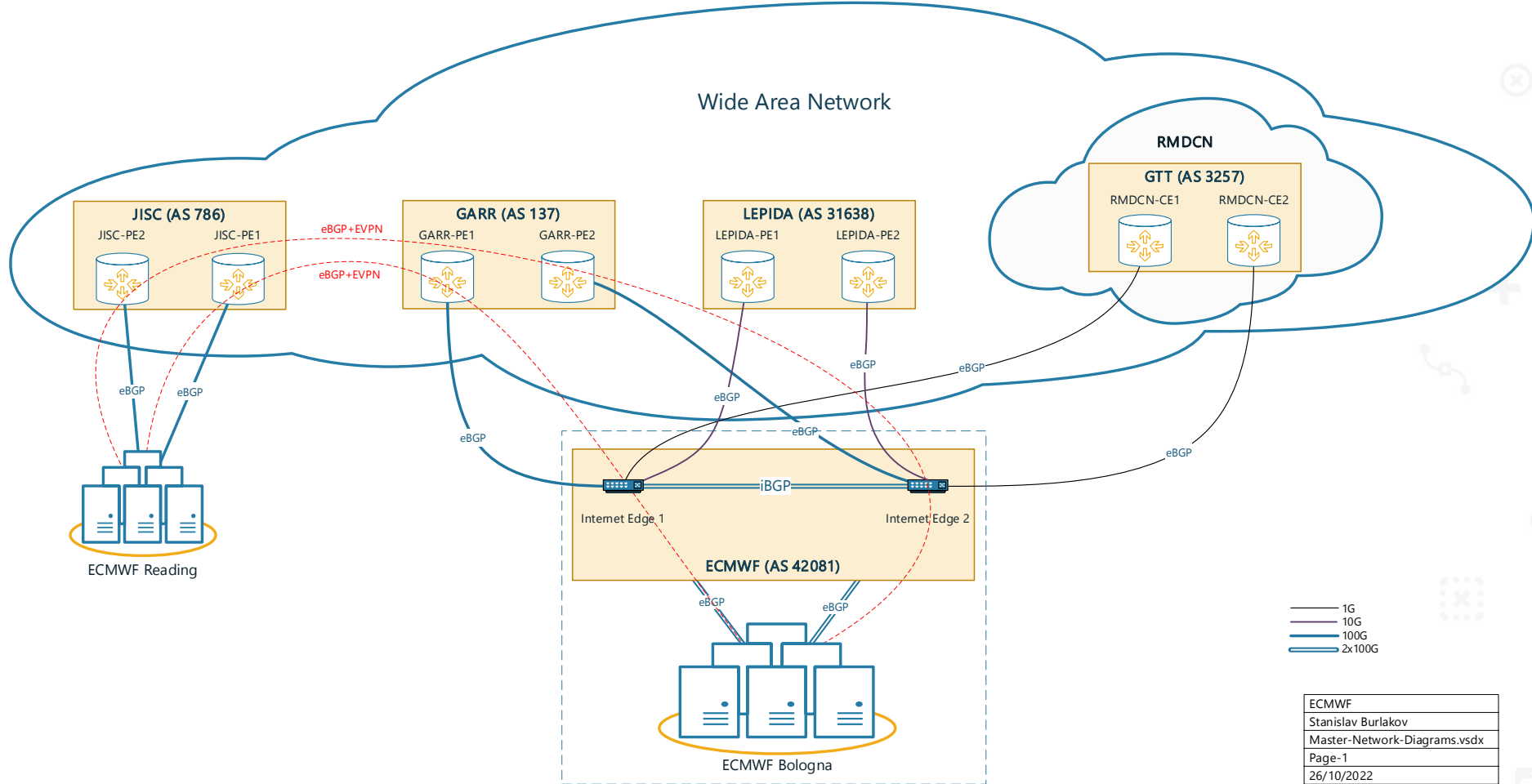


New set of technologies

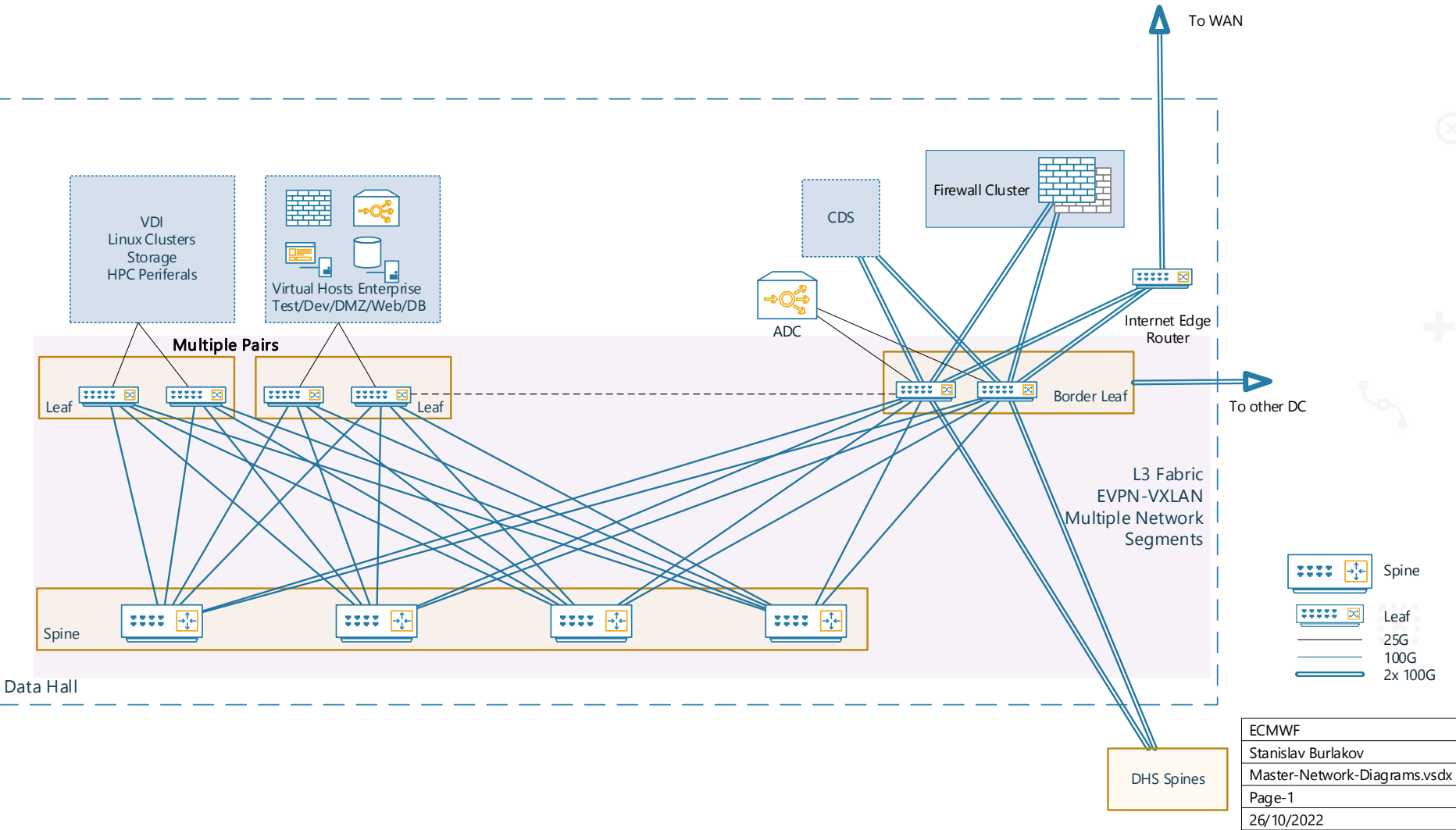
Change to different network equipment vendor and need for upskilling

Change from “classic” routing to EVPN/VXLAN IP fabrics

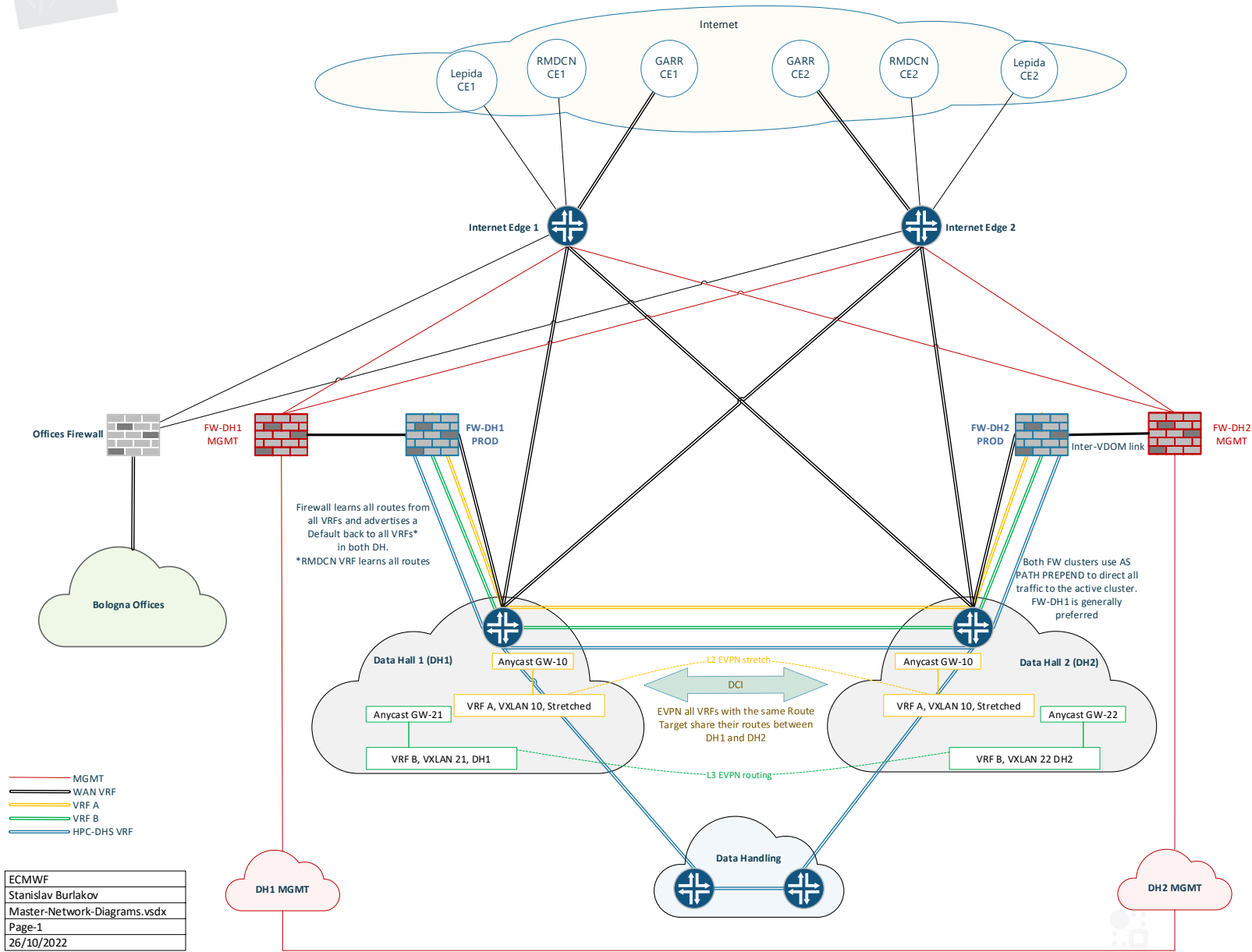
# WAN: Internet Edge design



# Data Centre: Data Hall Design



# Data Centre design

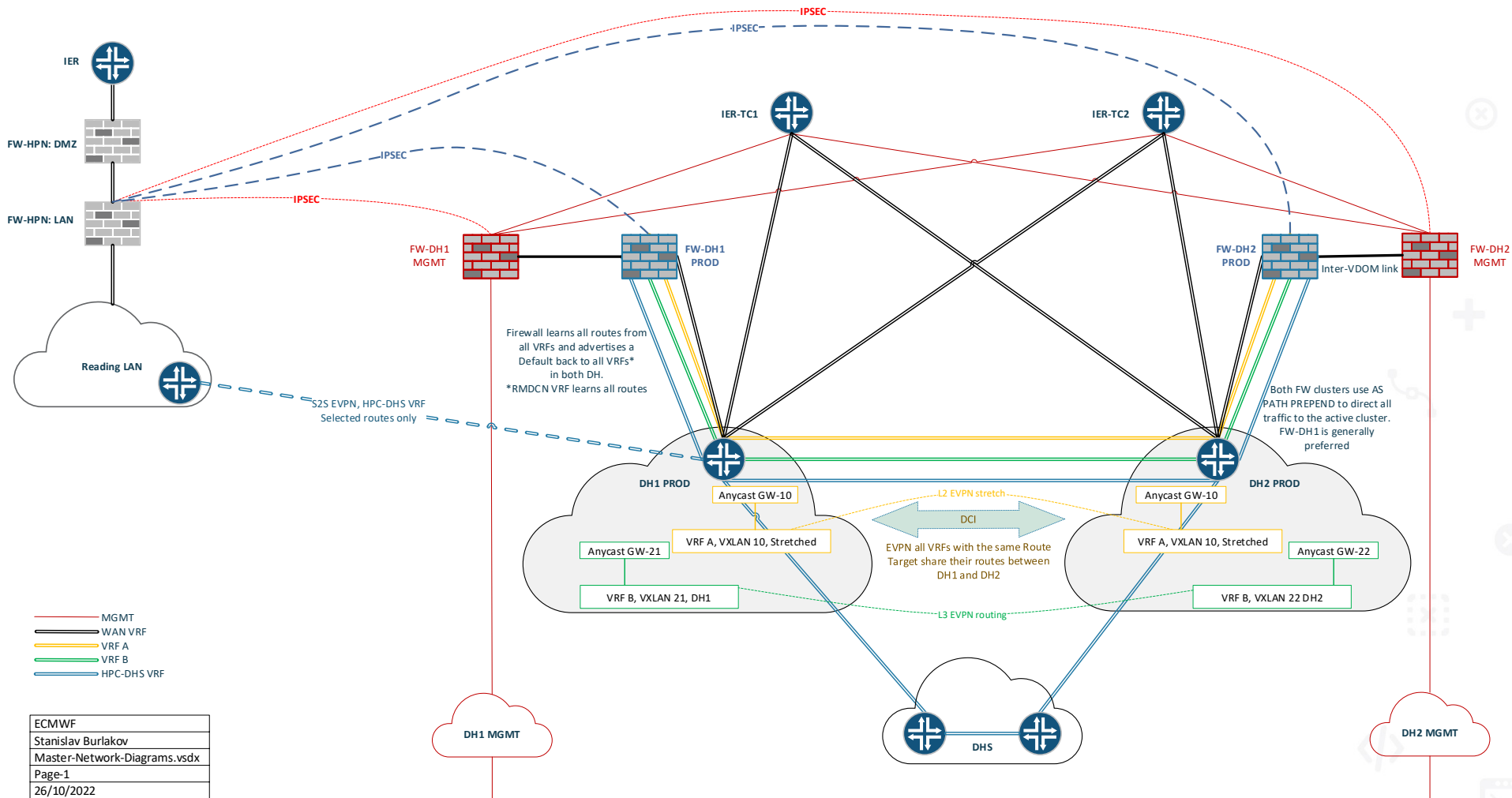


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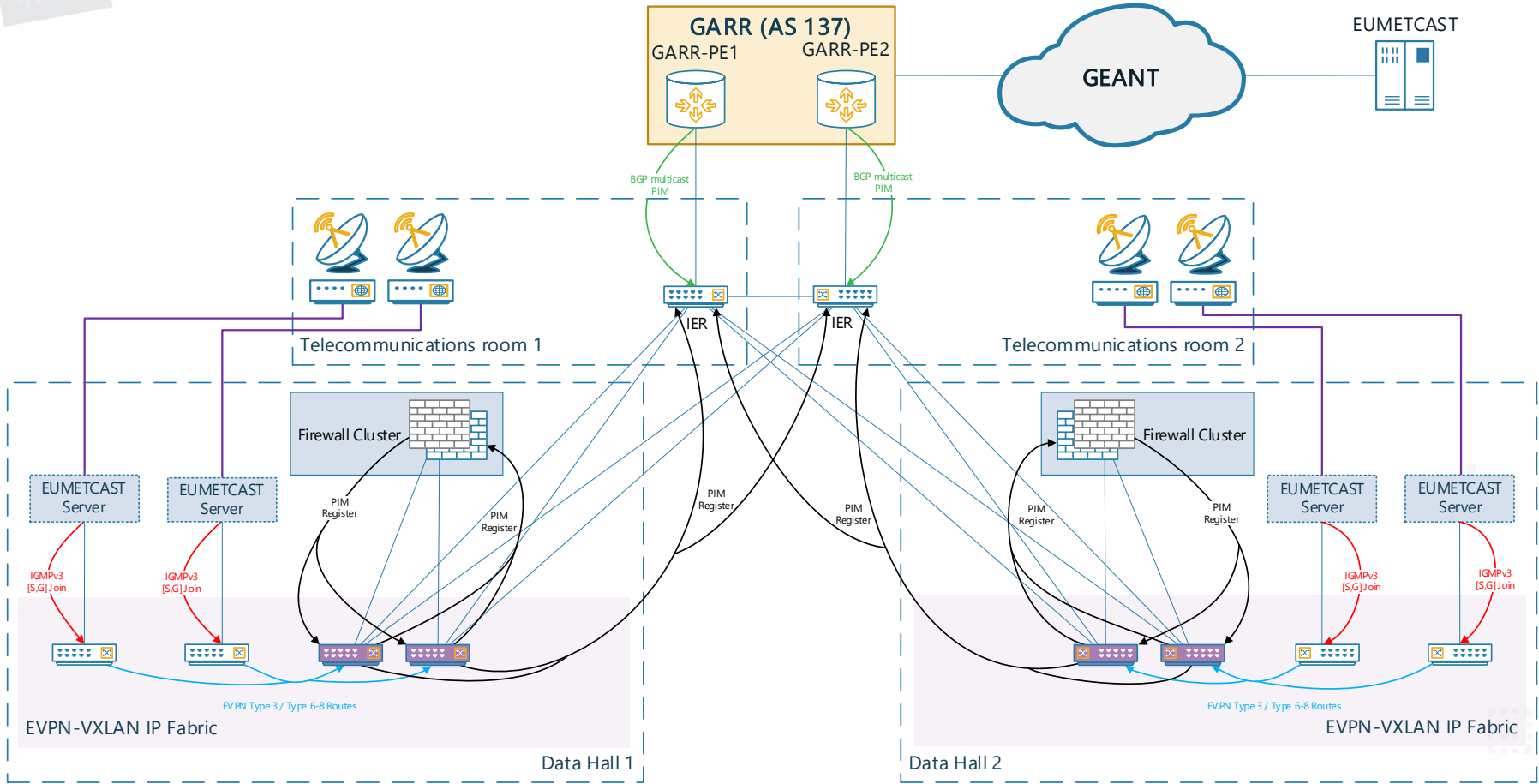




# WAN: Inter-site connectivity



# WAN: EUMETCAST with PIM-SSM



- SLS
- BLS
- IGMP
- EVPN
- PIM
- eBGP
- Terrestrial

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# Thank you! Questions?

