Asymmetric WAN Policy Enforcement (EIGRP + Extended ACL)

Objective

Design and implement a multi-router WAN topology using EIGRP for dynamic routing, then enforce asymmetric traffic control using an extended ACL to restrict Branch subnet access to a specific HQ server while preserving permitted inter-site communication.

Topology Overview

- Linear routed WAN: R1-HQ to R2-Transit to R3-Branch
- Serial point-to-point links (/30 addressing)
- HQ LAN: 10.10.10.0/24
- Branch LAN: 10.10.20.0/24
- EIGRP AS 100 with passive LAN interfaces

Implementation

Dynamic Routing Deployment

- Configured EIGRP (AS 100) across all routers
- Disabled auto-summary
- Advertised WAN and LAN subnets explicitly
- Verified adjacency using `[show ip eigrp neighbors]`
- Validated route propagation using `[show ip route]`

Result:
Full end-to-end inter-site connectivity established.

Extended ACL Policy Enforcement

Policy Requirement:

- Deny Branch (10.10.20.0/24) access to HQ-SRV1 (10.10.10.100)
- Permit all other traffic

Implementation:

- Created named extended ACL on R3
- Applied outbound on Serial0/0/0 toward HQ
- Verified deny/permit logic using ICMP testing
- Confirmed enforcement via ACL hit counters

Validation:

- Branch to HQ-SRV1: Denied
- Branch to HQ-PC: Allowed
- HQ to Branch: Allowed
- `[show access-lists]` confirmed incrementing deny counters

EIGRP Metric Manipulation

- Captured baseline feasible distance for 10.10.20.0/24 (2,682,112)
- Modified interface delay on R2 Serial0/0/1
- Observed recalculated metric increase to 7,290,112
- Verified updated feasible distance via routing table

Result:
Demonstrated understanding of EIGRP composite metric behavior and delay influence on path cost.

Key Technical Concepts Demonstrated

- Multi-router EIGRP configuration and validation
- WAN serial interface deployment with DCE clocking
- Extended ACL placement strategy (source-proximal enforcement)
- Asymmetric traffic control implementation
- EIGRP metric engineering and route cost manipulation
- CLI-based verification and troubleshooting