

## Terms in EIGRP (Enhanced Interior Gateway Routing Protocol)

EIGRP uses the **DUAL (Diffusing Update Algorithm)** to calculate the best and backup routes. The key terms are:

### ◆ **1. Feasible Distance (FD)**

- This is the **total cost (metric)** to reach a destination **from the local router**.
- Includes the cost from **your router to the neighbor + the neighbor's cost to the destination**.

 **This is the value EIGRP uses to install the best route into the routing table.**

Example:

If it costs 20 to reach the neighbor, and the neighbor says it's 30 to the destination,

$$FD = 20 + 30 = 50$$

### ◆ **2. Reported Distance (RD) (Also called Advertised Distance)**

- The **metric (cost)** that your **neighbor router reports** to reach a destination.
- It's **your neighbor's own feasible distance** to the destination.

Using above example:

RD = 30 (what neighbor reports)

FD = 50 (your cost to neighbor + RD)

### ◆ **3. Successor**

- The **best path (lowest Feasible Distance)** to reach a network.
- It's the route that goes directly into the **routing table**.

Every destination **must have a successor** (or EIGRP can't reach it).

### ◆ **4. Feasible Successor (Backup Route)**

- A **backup route** that's kept in the **EIGRP topology table**.
- It's **immediately available** if the successor fails — no recalculation needed.

 It must meet this important condition:

## **Feasibility Condition (Very Important)**

A route can be a Feasible Successor **only if**:

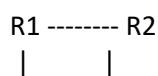
Reported Distance (RD) < Feasible Distance (FD) of the current successor

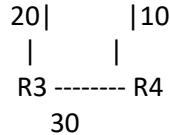
 This prevents **routing loops**.

## **Example Scenario:**

Imagine this EIGRP topology:

10





You're R1. You want to reach network **10.0.0.0/24** behind R4.

### Paths:

- R1 → R2 → R4 → 10.0.0.0 (Cost = 10 + 10 = **20**)
- R1 → R3 → R4 → 10.0.0.0 (Cost = 20 + 30 = **50**)
- R2 reports **RD = 10** to 10.0.0.0
- R3 reports **RD = 30** to 10.0.0.0

### At R1:

Route	RD (reported)	Cost to neighbor	FD (total)	Eligible as Feasible Successor?
R2 → R4 → 10.0.0.0	10	10	20	<input checked="" type="checkbox"/> Successor
R3 → R4 → 10.0.0.0	30	20	50	<input type="checkbox"/> No (30 > 20)

### Final Routing Table at R1:

- **Successor:** R2 path (lowest FD = 20)
- **Feasible Successor:**  None (R3 path fails the feasibility condition)