

The Four Nations Communication Alliance

Eldoria thrived for centuries under four nations: **Aeris**, **Pyron**, **Tundra**, and **Terranova**; until **Umbra**, a hidden rogue state, began intercepting messages and sabotaging trade. To survive, the nations formed the Council of Connectivity, charging you with building a resilient communication network essential to Eldoria's defense.

The Nations & Their Communication Demands

The Four Nations depend on secure communication, with diverse landscapes and technologies imposing strict constraints on your alliance-wide network design.

1. Aeris - The Skyborne Republic: Aeris, on floating islands, is a nation of scholars whose survival depends on flawless data preservation, making any communication breach critical.

Communication Directives:

- Requires fixed **static** IPs for all research and security devices.
- Hosts the alliance's main **Web** and **DNS** servers, with www.aeris-alliance.net displaying: "Peace Through Connection."

Aeris holds a central role because every nation relies on its **accuracy and server integrity**.

2. Pyron - The Flame Dominion: Pyron, built on volcanic strongholds, depends on rapid military response and continuous intelligence monitoring.

Communication Directives:

- Uses **DHCP via a local Pyron PC** server to counter unstable magnetic fields.
- Hosts an **Email server** and maintains constant intelligence exchange with **Terranova** during Umbra threats.

Pyron favors **speed and adaptability**, making static addressing unsuitable for its mobile military operations.

3. Tundra - The Frozen Frontier: Carved into icy cliffs and crystal caverns, Tundra relies on underground frost tunnels where blizzards can cut off regions without warning.

Communication Directives:

- Receives IPs from **Terranova's DHCP** due to unstable local power.
- Uses **RIPv2** with redundant routes to prevent communication outages.

Tundra's systems prioritize **survivability through adaptability**, not precision.

4. Terranova - The Riverlands: Terranova's vast river networks make it the logistical core of Eldoria, where uninterrupted data flow supports trade, irrigation, and transport.

Communication Directives:

- Uses **static addressing** for critical administrative and infrastructure devices.
- Serves as the **Central DHCP Authority**, assigning IPs to:
 - Terranova
 - Tundra
 - Umbra
- Hosts an **Email Server** for strategic intelligence exchange with **Pyron**.

Terranova is the **core stabilizer**, ensuring the network can supply the less stable regions during crises.

5. Umbra - The Rogue Shadow State: Hidden in the southern caverns, Umbra's network is unstable, secretive, and hostile. It is not an alliance member; access is solely for surveillance.
Communication Directives:

- Receives **addresses only via Terranova's DHCP**; self-assignment is prohibited.
- Cannot communicate directly with Aeris; path is: Umbra → Terranova → Pyron → Aeris.
- Routing permissions are strictly limited by design.

Umbra is a **controlled endpoint**, not a partner.

Population / Host Requirements

Each nation has intelligence posts, monitoring centers, research hubs, and public terminals. While the topology shows **two PCs per nation**, actual subnets must support:

Nation	Active Devices
Aeris	1520
Pyron	830
Tundra	410
Terranova	1020
Umbra (Rogue Outpost)	45

Network Requirements

Below are the **mandatory operational rules** governing the network.

1. Logical Addressing Requirements

You must follow DHCP distribution hierarchy:

- **Pyron → local DHCP server (only for Pyron)**
- **Terranova → central DHCP server (for Terranova, Tundra, Umbra)**

This provides stable addressing for fixed regions and flexible addressing for mobile or unstable areas.

2. Core Network Services

A. DNS and Web Server Services

- Aeris hosts the alliance **DNS** and **Web server**, displaying: "**Peace Through Connection.**"

B. Email Services for Strategic Communication (Pyron ↔ Terranova)

- Pyron and Terranova must exchange intelligence via fully functional **SMTP** and **POP3** services using **mail.pyron.net** and **mail.terranova.net**.

C. DHCP Roles

- **Pyron** must manage its own DHCP pool independently.
- Terranova must manage three separate DHCP pools:
 - Terranova
 - Tundra
 - Umbra

Tundra and Umbra routers must operate as DHCP relay agents.

3. Routing Infrastructure

A. Mandatory Routing Rules

- Aeris and Pyron must communicate using **static** routing.
- Tundra and Terranova must use **RIPv2 dynamic routing**.
- All other links may use either method, within the given limits.

Floating Static Route: Aeris needs a **backup static route** to Tundra via Pyron with **AD 25**, used only if the dynamic route fails.

Default Route Rule: Default routes are forbidden; all routes must be explicitly defined (static or RIPv2-learned)

B. Special Connectivity Rules: Umbra can reach Aeris only via Terranova and Pyron, and Pyron–Tundra must use two routers to avoid single points of failure.

4. Required Output

You must produce:

- A **single primary network** block with **VLSM** to create precise subnets for all five nations.
- Network Address Table
- Router Configuration Commands
- Fully working Packet Tracer topology
- Functional Pings between all nations