



Deployment and Integration of eduVPN within the French NREN (RENATER)

10/06/2026

Renater & Project Overview

- **Renater : French NREN**

- RENATER is France's National Research and Education Network (NREN), interconnecting over 800 universities and research institutions.
- Provides secure connectivity and digital services to more of 2 millions users.

- **Project History and Evolution**

- 2019: Initial deployment of eduVPN as a single-VM "Controller-Node"
- 2025–2026 Revival: Review of the service architecture for scaling and to follow new french regulations

- **The Target**

- Deliver a sovereign, mutualized, and scalable VPN solution available to the entire French ESR community for secure internet access.
- Demonstrate to the french community that the solution is robust and can be used as a replacement for existing solutions
- Help the community to respond to new regulations for deploying Eduvpn

Architecture & Intégration

- **Core Infrastructure Components**

- 1 Controller & 2 Nodes, isolated via 2 separate Virtual Systems (VSYS).

- **Authentication Flow**

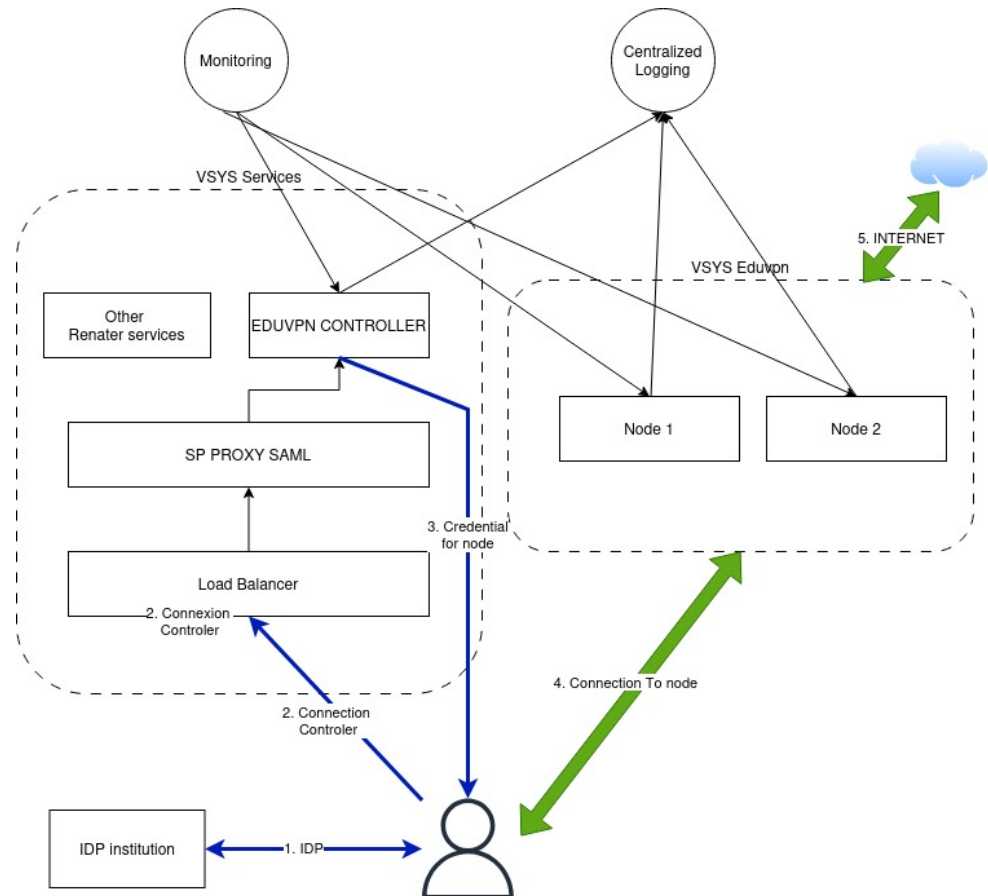
- LoadBalancer → Reverse Proxy SAML Service Provider → eduVPN Controller
- Direct encrypted tunnels (OpenVPN / WireGuard) to dedicated Nodes.

- **Monitoring:**

- Resource tracking (CPU/RAM), Web portal availability, Outbound Internet verification, active sessions (API), and real-time network throughput,

- **Traceability**

- Centralized, immutable, and externalized log management.



Security, Privacy & Compliance

- **Logged Attributes**

- Identity : User's home institution, EPPN (EduPersonPrincipalName)
- Session & Destination: VPN-assigned internal IP address, visited destination IPs, and precise timestamps.

- **Legal & Operational Obligations**

- Tier-2 ISP Status: Legal requirement to maintain a strict 1-year traceability (user ↔ VPN IP ↔ Destination IP).
- Integration with RENATER's CERT to identify, trace, and isolate infected or compromised user endpoints.

- **Security Governance & Accreditation**

- ANSSI Alignment: Compliance with French National Cybersecurity Agency guidelines.
- Official Homologation: Formal security accreditation validated jointly by the CISO, DPO.

RETEX & Industrialization

- **Integration**

- Out-of-the-box deployment: Standard installation is straightforward thanks to default scripts and official documentation.
- Deep integration into a complex, pre-existing network infrastructure may introduce some challenges. For instance :
 - Proxyguard was hindered by intermediate reverse proxies (our SAML Service Provider).
 - The HTTP connection upgrade required by WireGuard-over-Proxyguard was systematically stripped out by these intermediate layers.

- **Industrialization & Resilience**

- Developed a custom Ansible Playbook to automate and standardize the deployment of our infrastructure.

Future Roadmap & Perspectives

- **Knowledge Transfer & Community Enablement**

- Authoring comprehensive French documentation and emergency "runbooks" (fiches réflexes) for future sysadmins.
- Designing and delivering dedicated training sessions in French.
- Sharing our implementations and various initiatives with other NRENs so they can be reused if needed

- **Community Outreach**

- Presentation and feedback session at french National Network Event (JRES) 2026.

- **Architecture Evolution**

- Evaluating the integration of VPN Nodes behind the Load balancer for automated failover and optimal load balancing.

- **eduVPN Hosting (POC)**

- Exploring a hosted solution tailored for smaller institutions.
- Enabling their students and staff to securely access internal networks without requiring local infrastructure deployment.