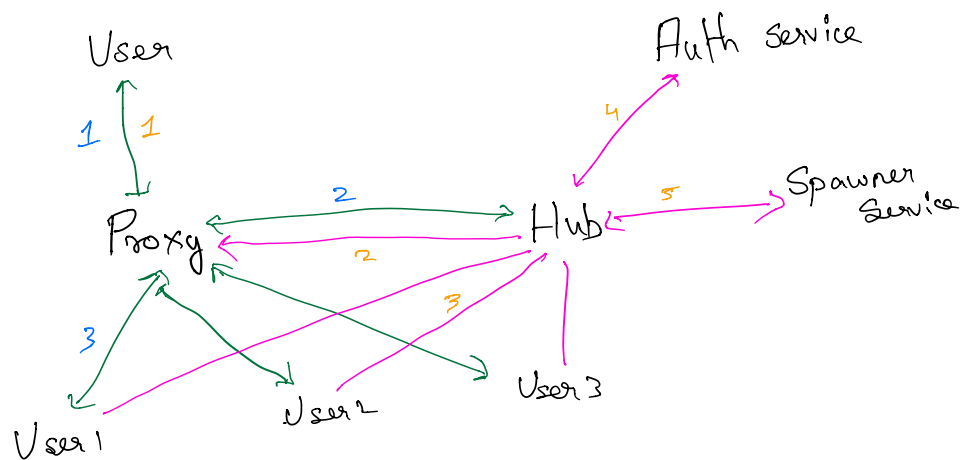


Hub data flows & ways of securing them



- Control Path
- Data Path

Authentication / Authorization mechanism

1. Cookie Auth
2. Token Auth
3. Hub OAuth
4. Auth service creds
 - OAuth client secret / key → Github, Google, etc
 - LDAP bind credentials → LDAP
 - Running as Root → local PAM auth
 - LTI shared secret → EdX, Canvas LTI
 - Signing key → JWT
5. Spawner access credentials
 - kubernetes credentials → k8s
 - docker.sock access → Docker
 - Running as root → systemd, local process
 - SLURM / Torque / HPC creds → batchspawners

Data Confidentiality / Integrity Mechanism

1. HTTPS / Let's Encrypt
2. Internal HTTPS w/ proxy
3. Internal HTTPS
 - JupyterHub 1.0, if spawner supports it
 - Service Mesh → Istio, Linkerd etc.