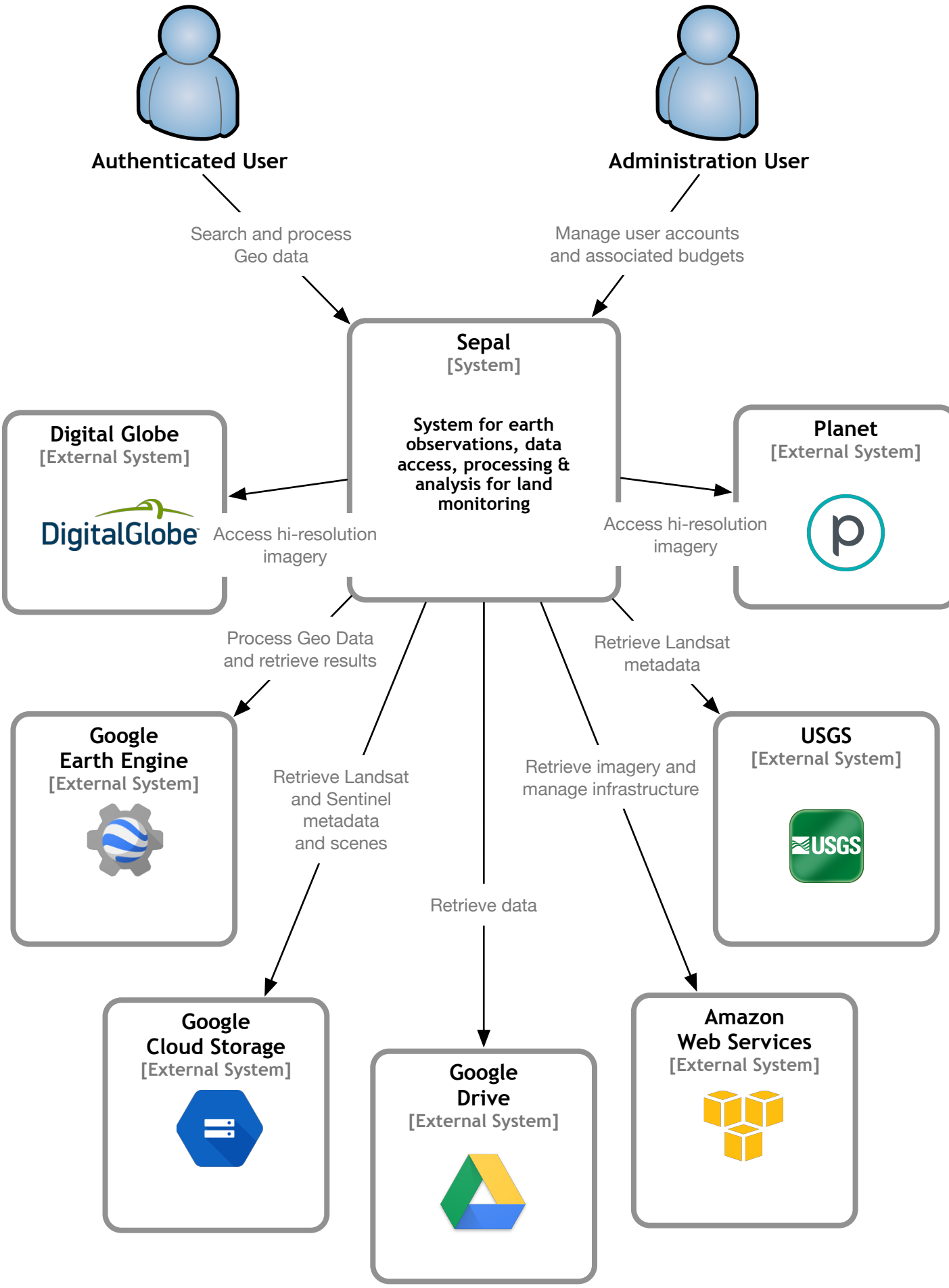
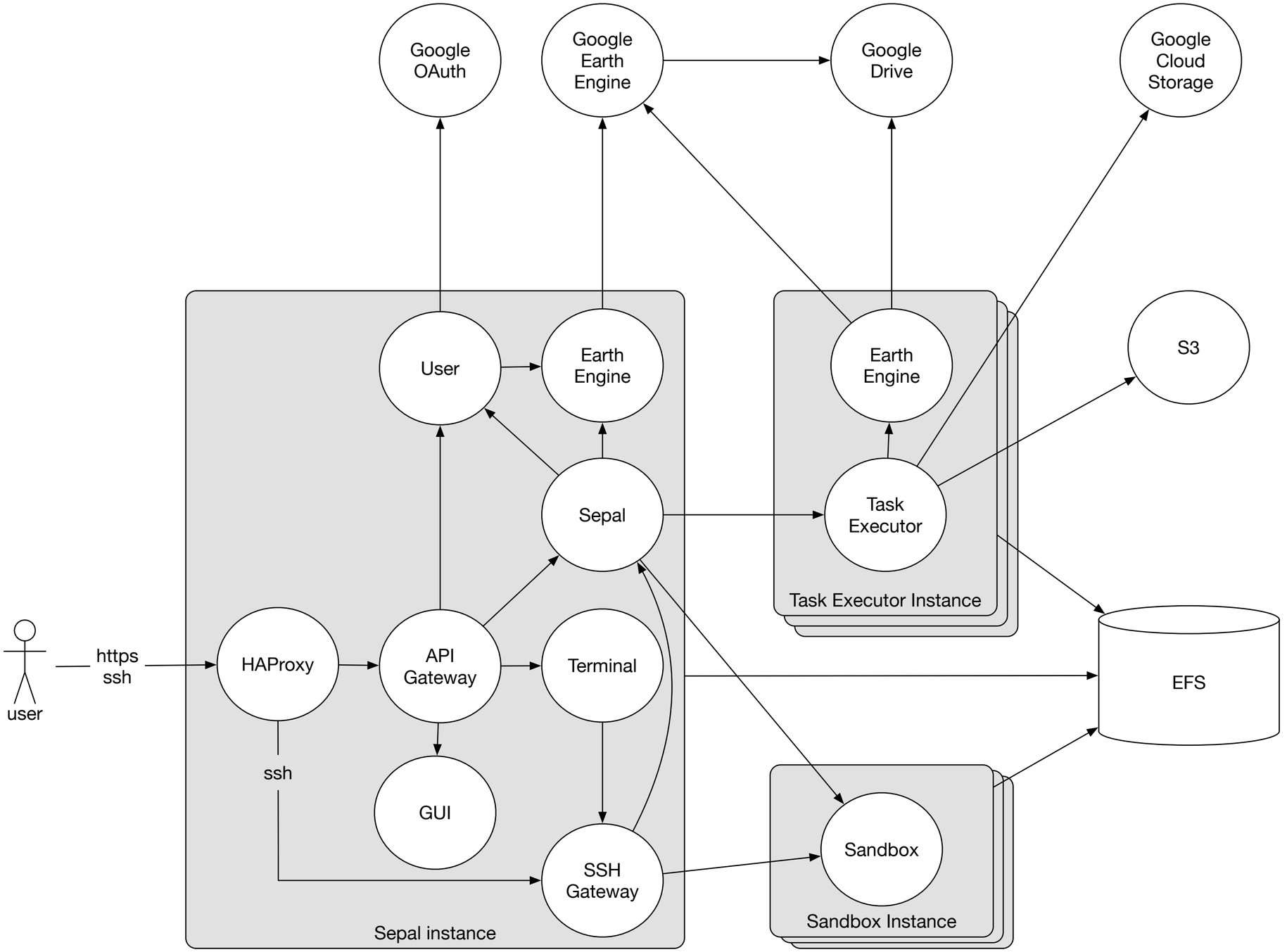
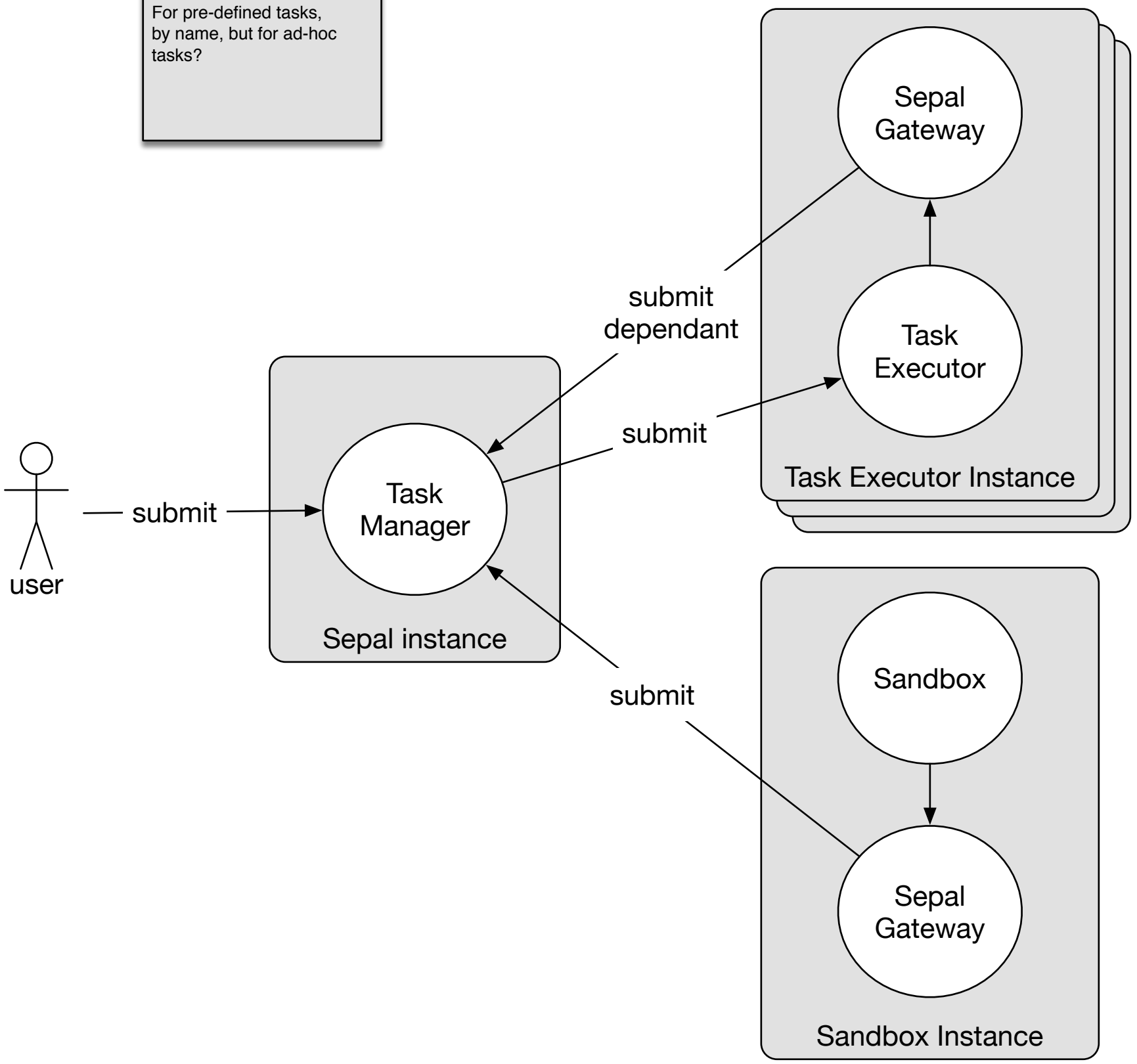

Authenticated User
Administration User
Search and process Geo data
Manage user accounts and associated budgets
Sepal
[System]
System for earth observations, data access, processing & analysis for land monitoring
Digital Globe
[External System]
DigitalGlobe
Access hi-resolution imagery
Planet
[External System]
Access hi-resolution imagery
Process Geo Data and retrieve results
Retrieve Landsat metadata
Google Earth Engine
[External System]
Retrieve Landsat and Sentinel metadata and scenes
Retrieve imagery and manage infrastructure
USGS
[External System]
USGS
Retrieve data
Google Cloud Storage
[External System]
Google Drive
[External System]
Amazon Web Services
[External System]

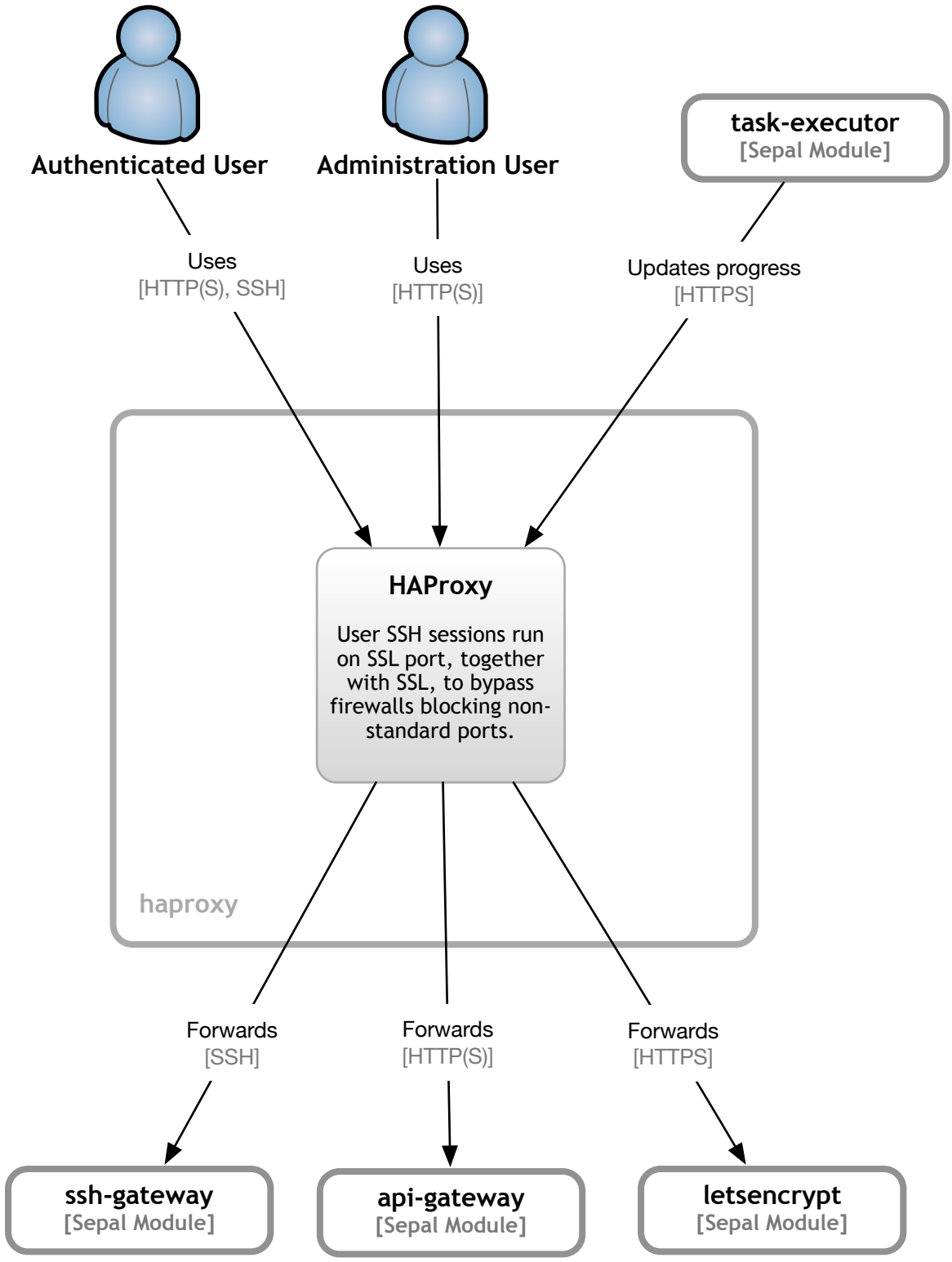

Google
OAuth
Google
Earth
Engine
Google
Drive
Google
Cloud
Storage
User
Earth
Engine
Earth
Engine
S3
Sepal
Task
Executor
Task Executor Instance
user
https
ssh
HAProxy
API
Gateway
Terminal
EFS
ssh
GUI
SSH
Gateway
Sandbox
Sandbox Instance
Sepal instance

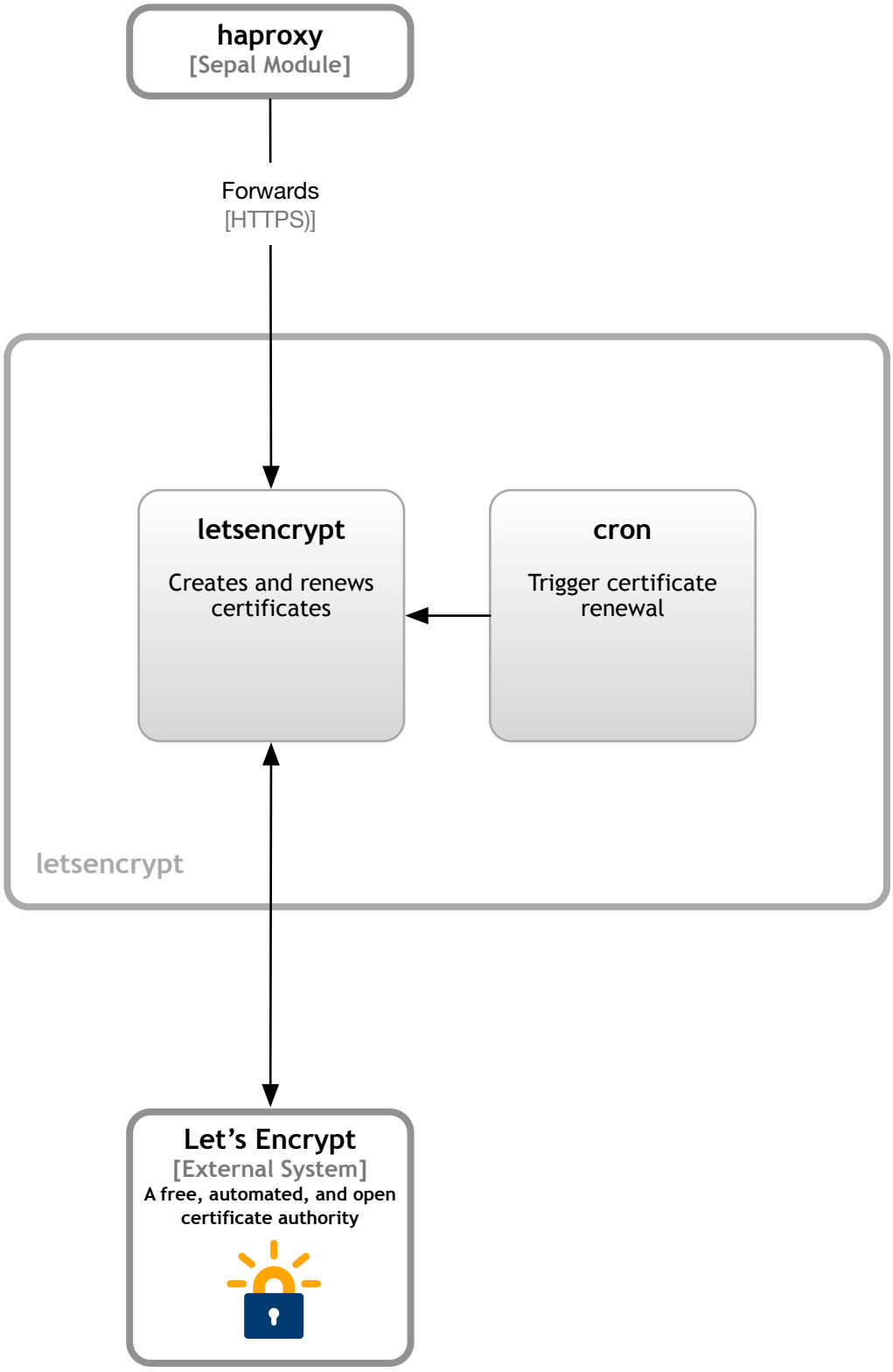
Planned feature

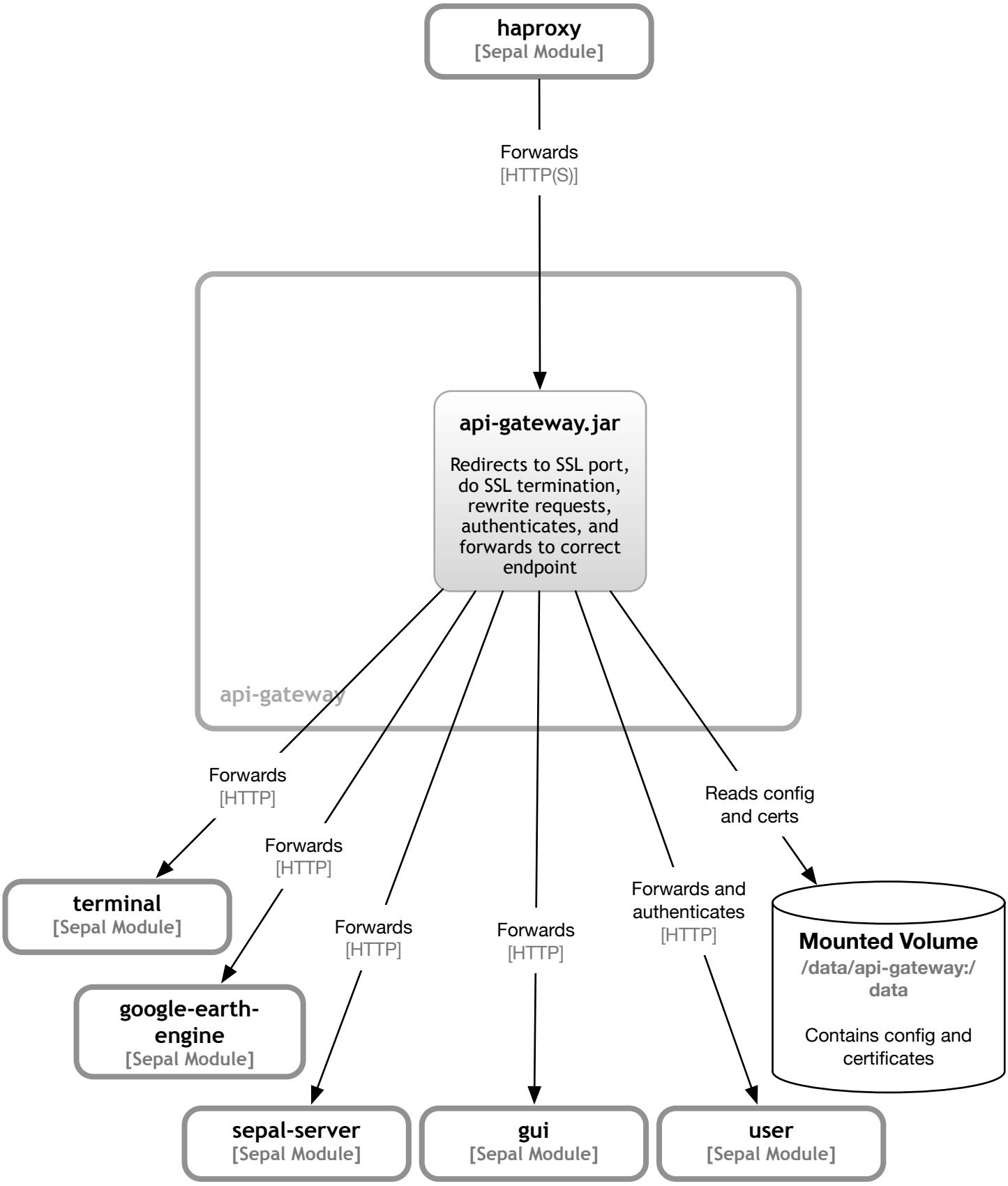
How to specify
the task to execute?

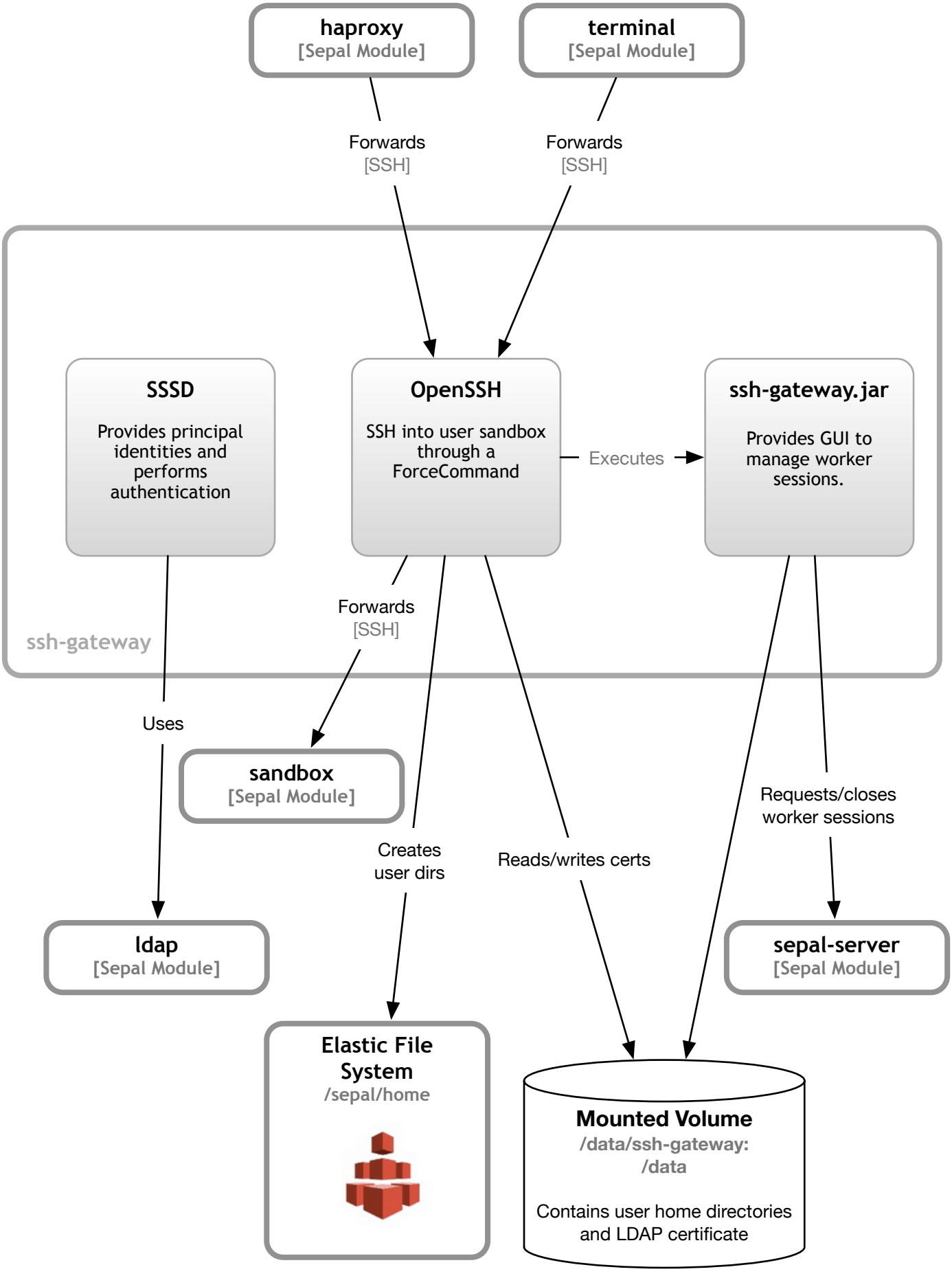
For pre-defined tasks,
by name, but for ad-hoc
tasks?

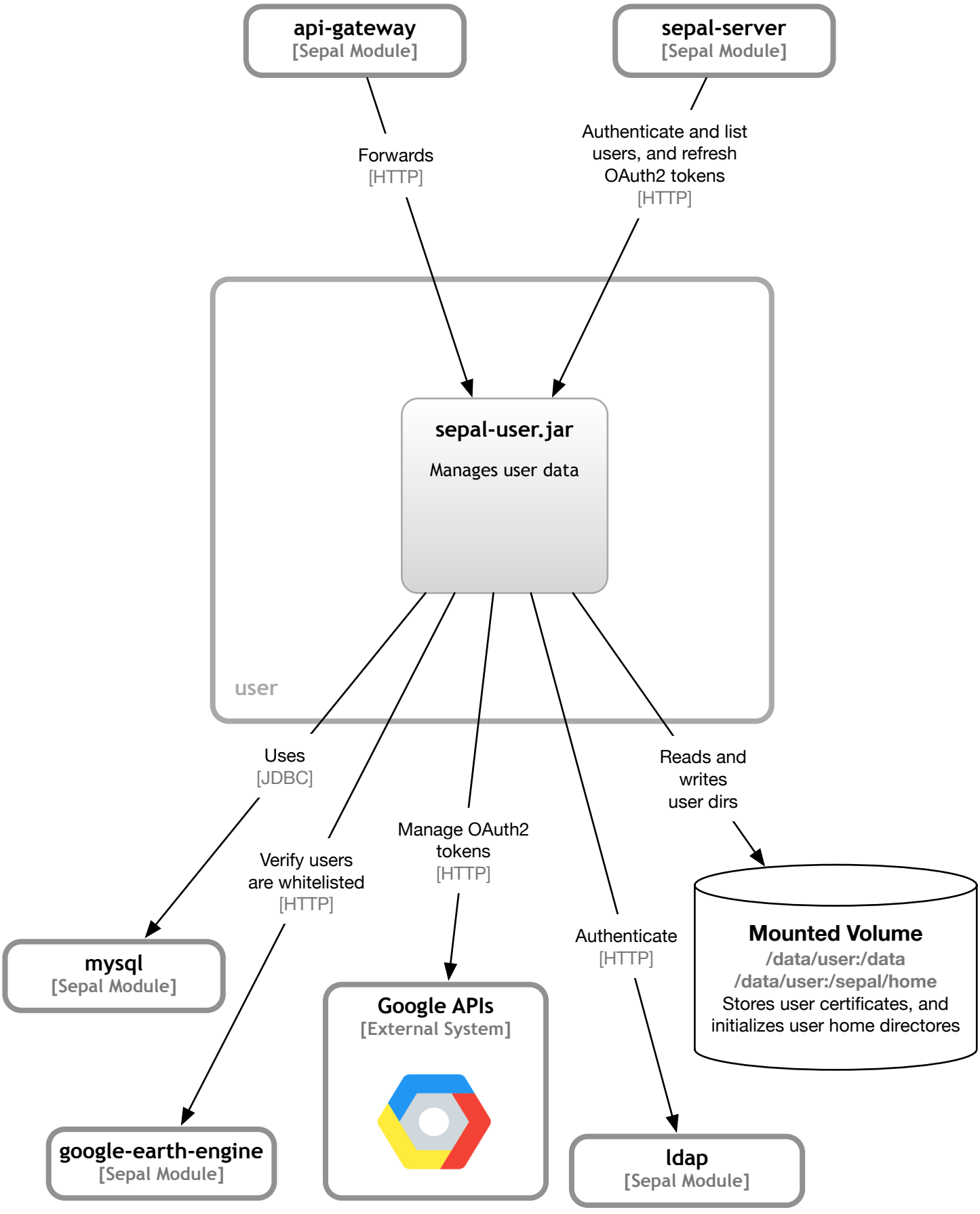


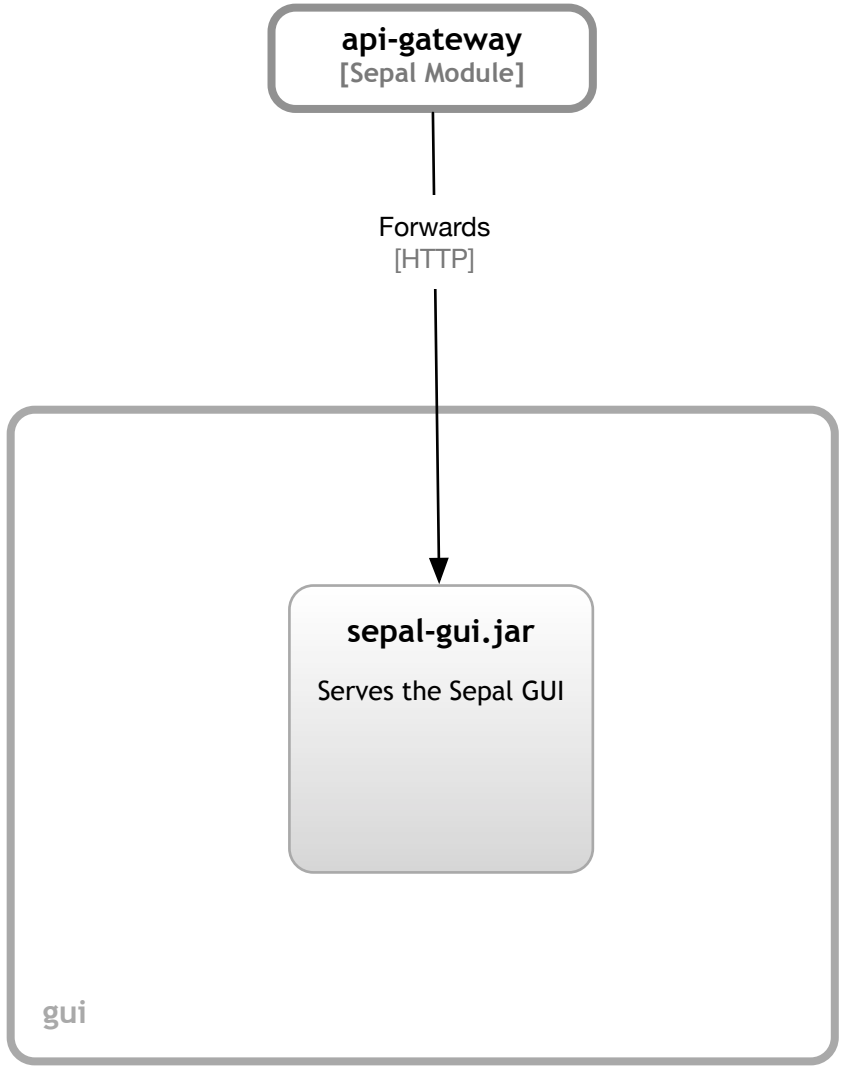

Authenticated User
Administration User
task-executor
[Sepal Module]
Uses
[HTTP(S), SSH]
Uses
[HTTP(S)]
Updates progress
[HTTPS]
HAProxy
User SSH sessions run on SSL port, together with SSL, to bypass firewalls blocking non-standard ports.
haproxy
Forwards
[SSH]
Forwards
[HTTP(S)]
Forwards
[HTTPS]
ssh-gateway
[Sepal Module]
api-gateway
[Sepal Module]
letsencrypt
[Sepal Module]

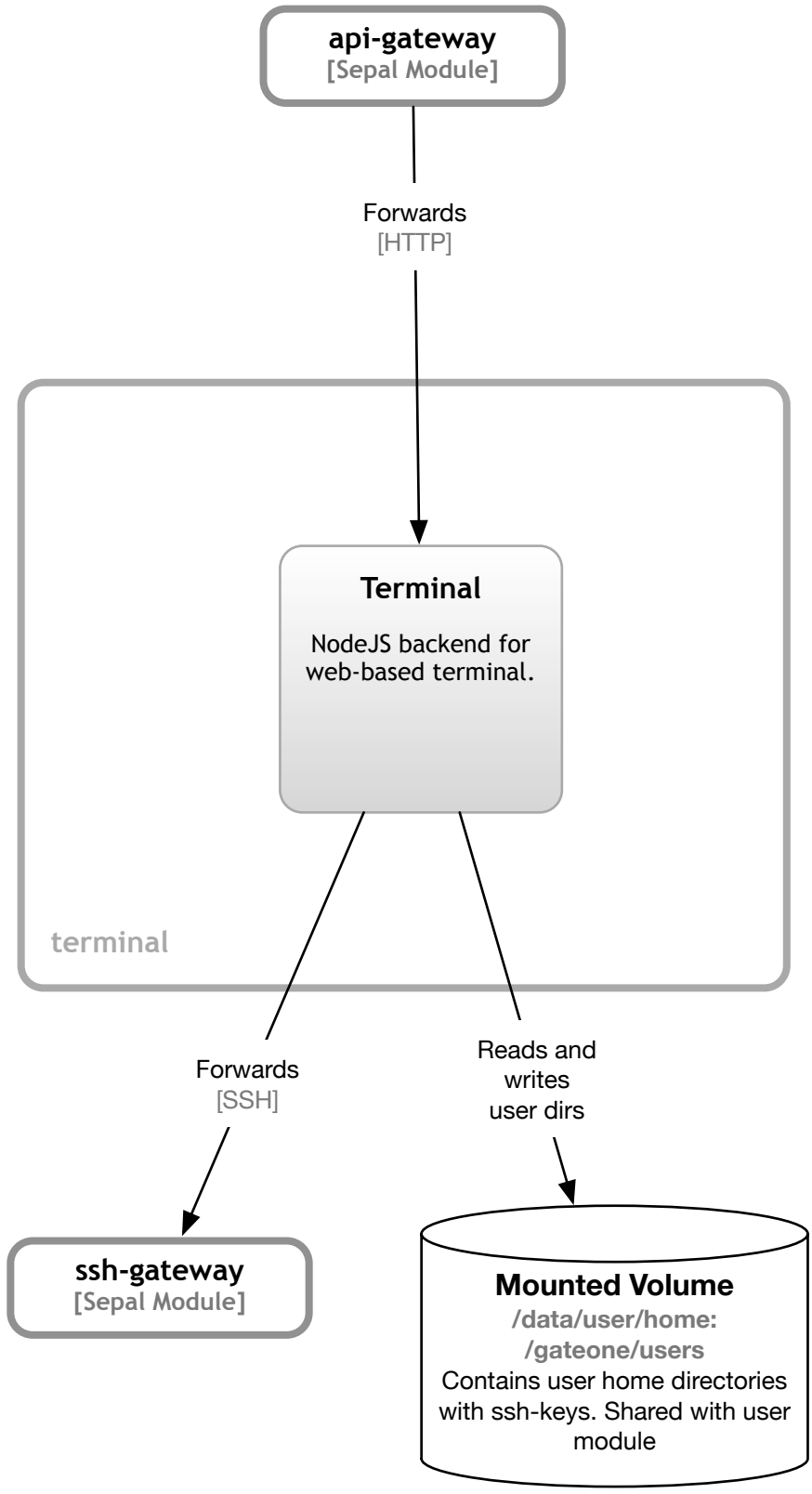

haproxy
[Sepal Module]
Forwards
[HTTPS)]
letsencrypt
Creates and renews certificates
cron
Trigger certificate renewal
letsencrypt
Let's Encrypt
[External System]
A free, automated, and open certificate authority

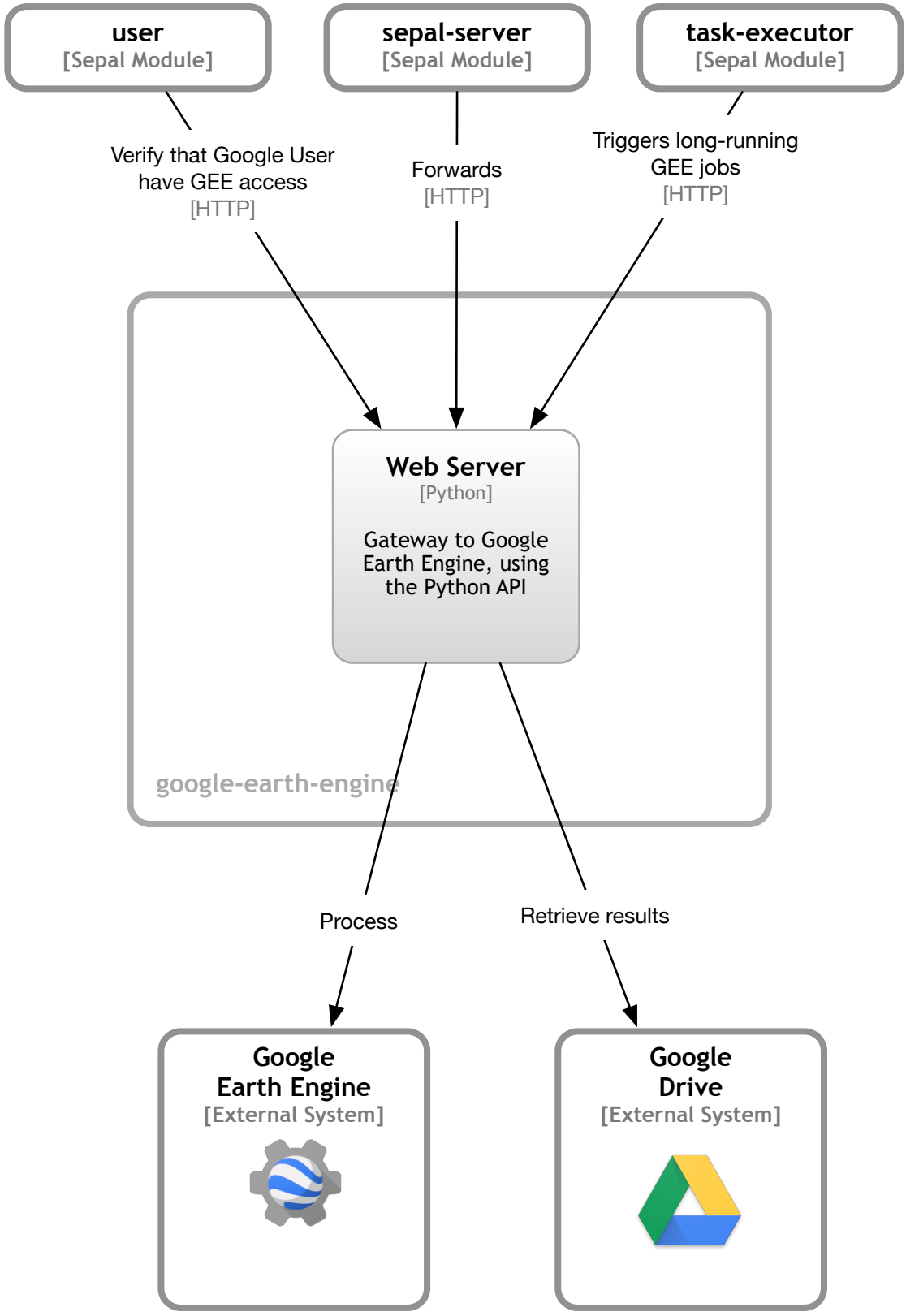

haproxy
[Sepal Module]
Forwards
[HTTP(S)]
api-gateway.jar
Redirects to SSL port, do SSL termination, rewrite requests, authenticates, and forwards to correct endpoint
api-gateway
Forwards
[HTTP]
Forwards
[HTTP]
Forwards
[HTTP]
Forwards
[HTTP]
Forwards and authenticates
[HTTP]
Reads config and certs
terminal
[Sepal Module]
google-earth-engine
[Sepal Module]
Mounted Volume
/data/api-gateway:/data
Contains config and certificates
sepal-server
[Sepal Module]
gui
[Sepal Module]
user
[Sepal Module]

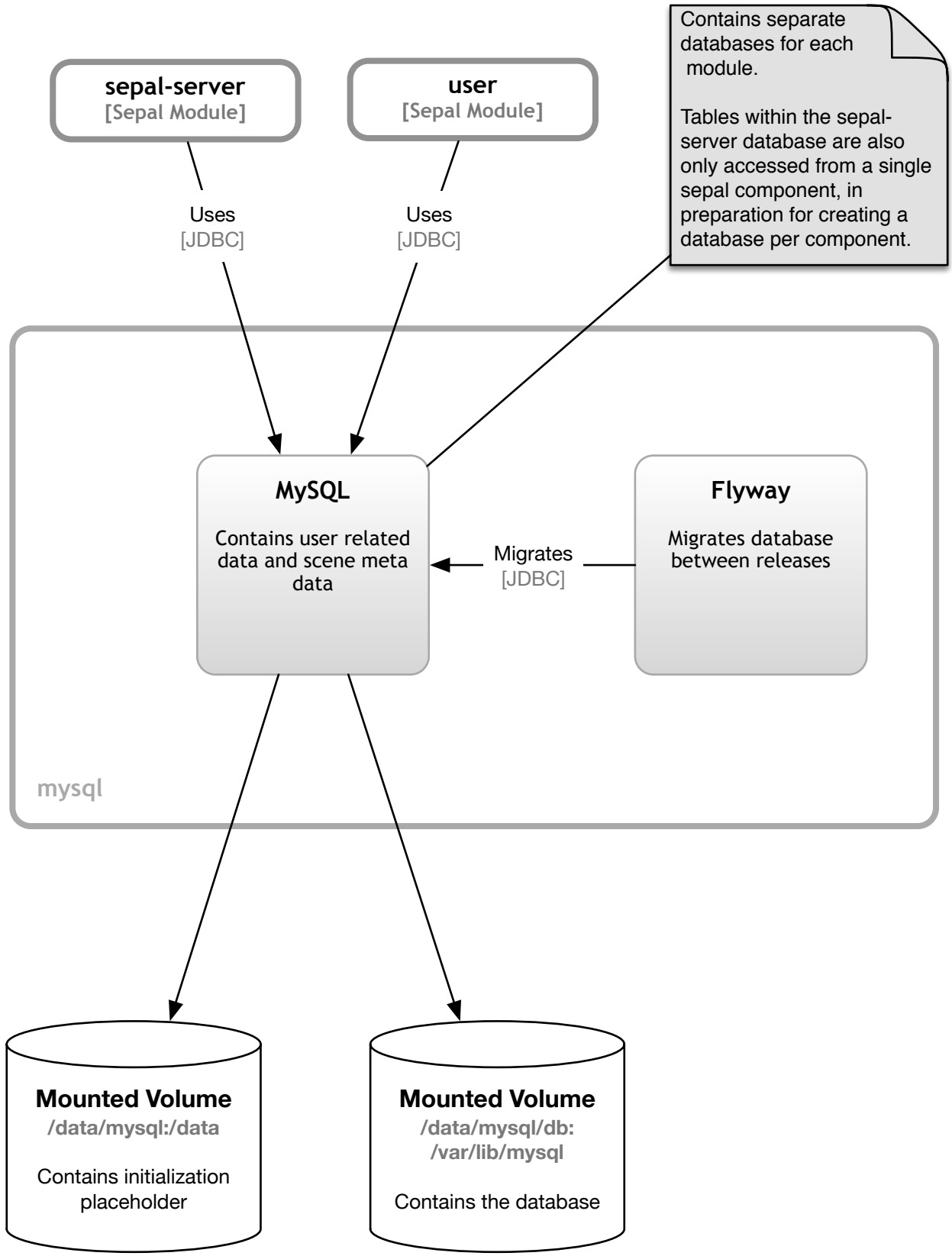

haproxy
[Sepal Module]
terminal
[Sepal Module]
Forwards
[SSH]
Forwards
[SSH]
SSSD
Provides principal identities and performs authentication
OpenSSH
SSH into user sandbox through a ForceCommand
Executes
ssh-gateway.jar
Provides GUI to manage worker sessions.
ssh-gateway
Forwards
[SSH]
Uses
sandbox
[Sepal Module]
Creates user dirs
Reads/writes certs
Requests/closes worker sessions
ldap
[Sepal Module]
sepal-server
[Sepal Module]
Elastic File System
/sepal/home
Mounted Volume
/data/ssh-gateway:
/data
Contains user home directories and LDAP certificate

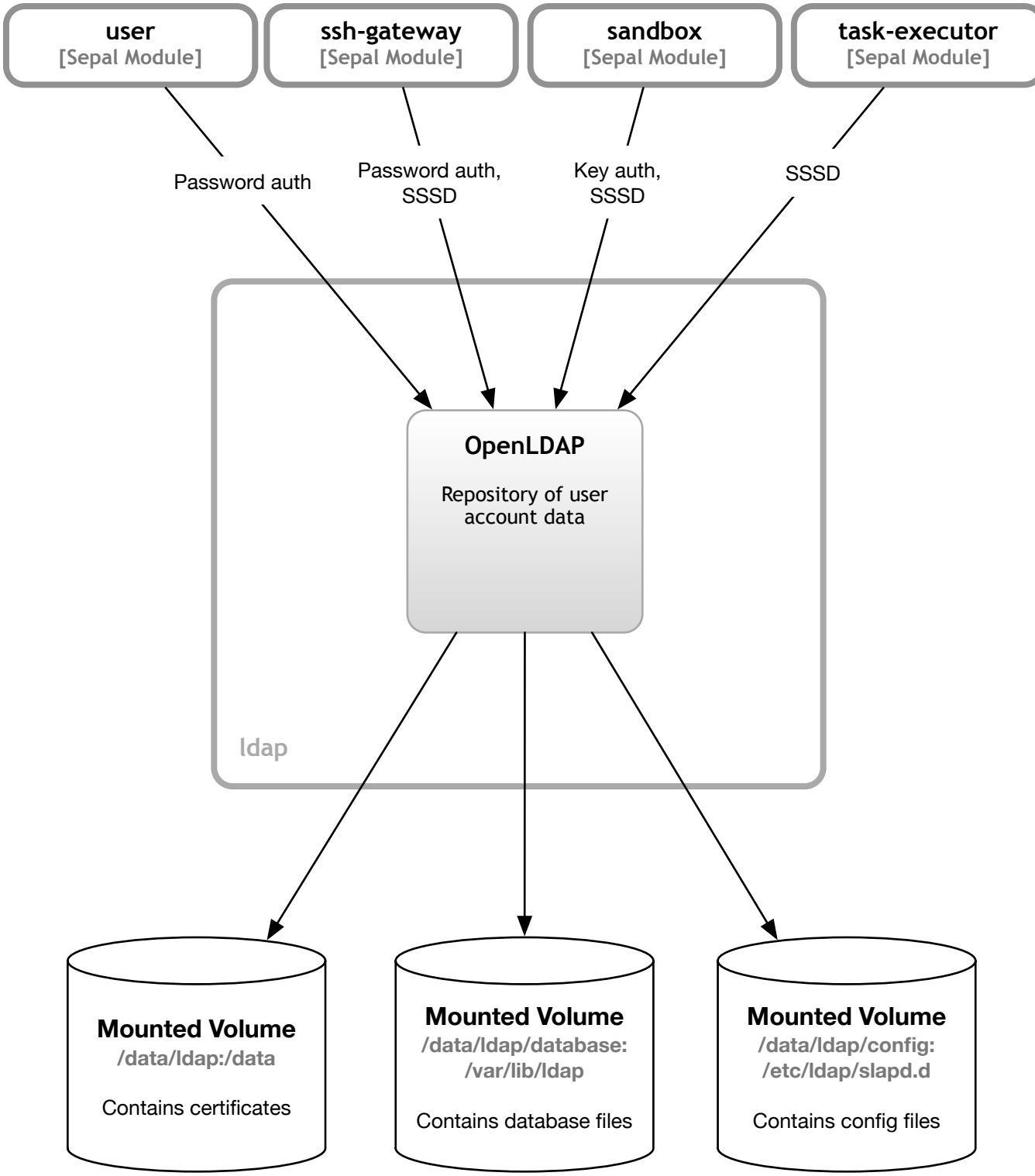

api-gateway
[Sepal Module]
sepal-server
[Sepal Module]
Forwards
[HTTP]
Authenticate and list users, and refresh OAuth2 tokens
[HTTP]
sepal-user.jar
Manages user data
user
Uses
[JDBC]
Verify users are whitelisted
[HTTP]
Manage OAuth2 tokens
[HTTP]
Authenticate
[HTTP]
Reads and writes user dirs
mysql
[Sepal Module]
google-earth-engine
[Sepal Module]
Google APIs
[External System]
ldap
[Sepal Module]
Mounted Volume
/data/user:/data
/data/user:/sepal/home
Stores user certificates, and initializes user home directores

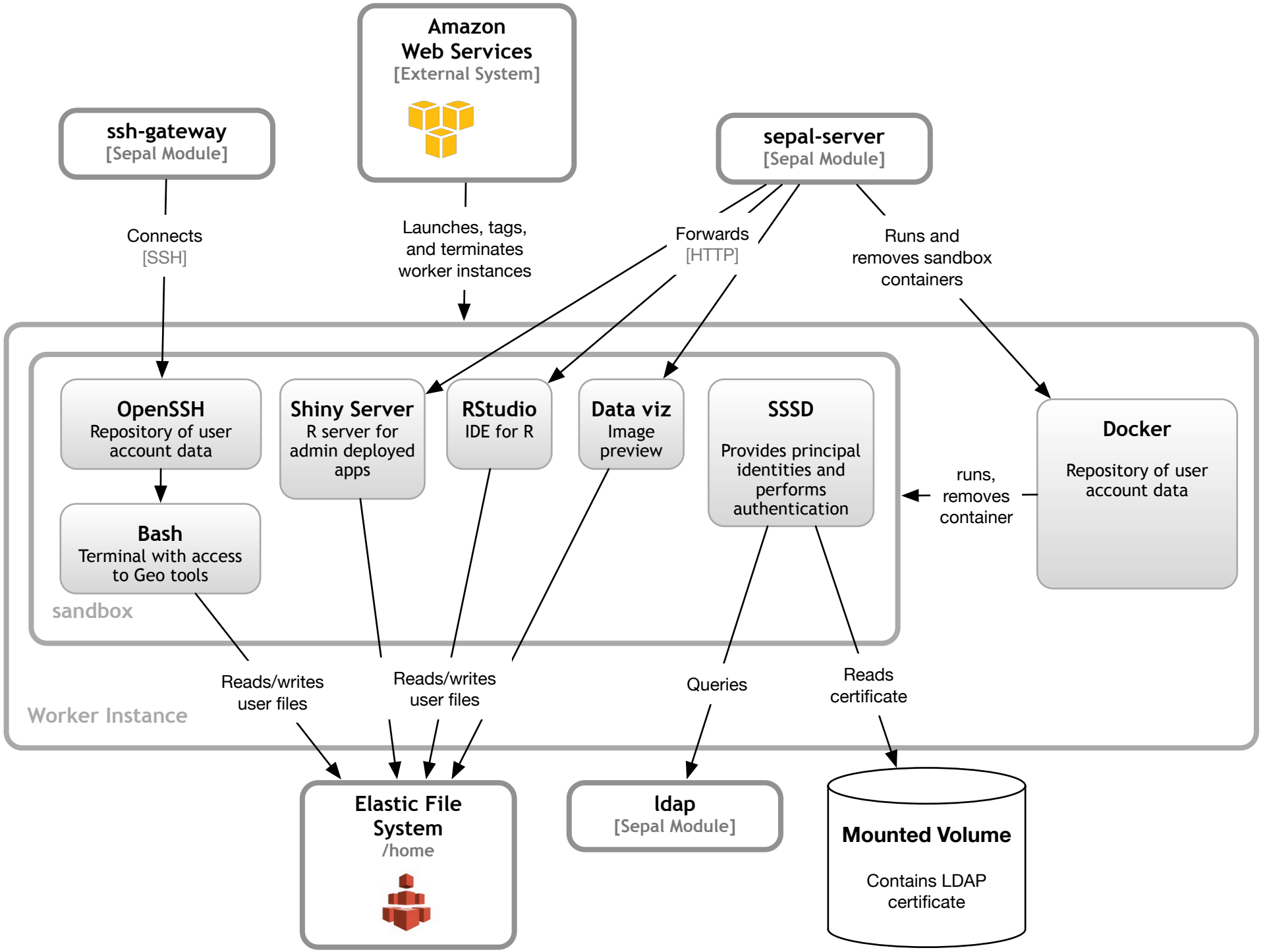

api-gateway
[Sepal Module]
Forwards
[HTTP]
sepal-gui.jar
Serves the Sepal GUI
gui

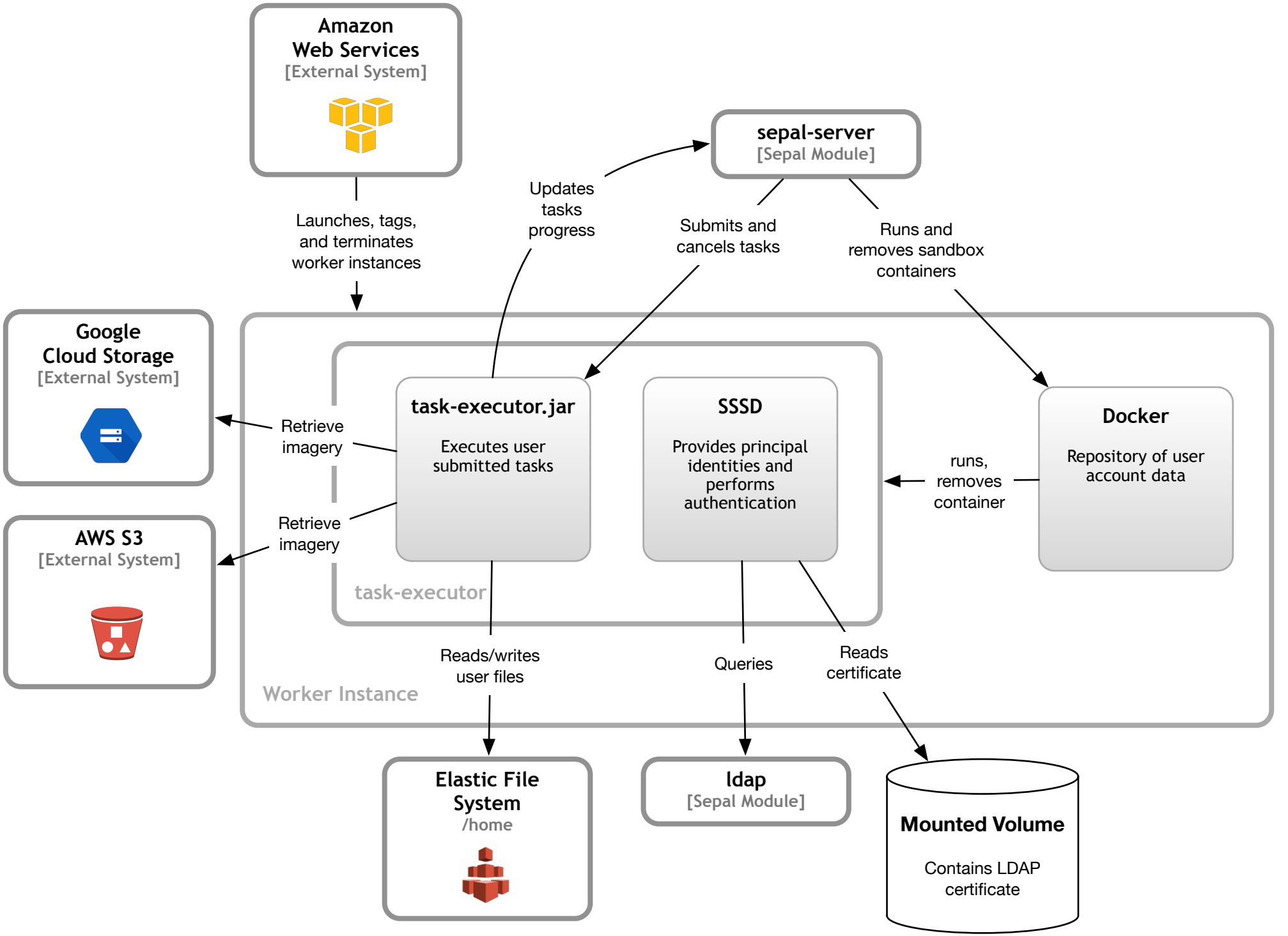

api-gateway
[Sepal Module]
Forwards
[HTTP]
Terminal
NodeJS backend for
web-based terminal.
terminal
Forwards
[SSH]
Reads and
writes
user dirs
ssh-gateway
[Sepal Module]
Mounted Volume
/data/user/home:
/gateone/users
Contains user home directories
with ssh-keys. Shared with user
module

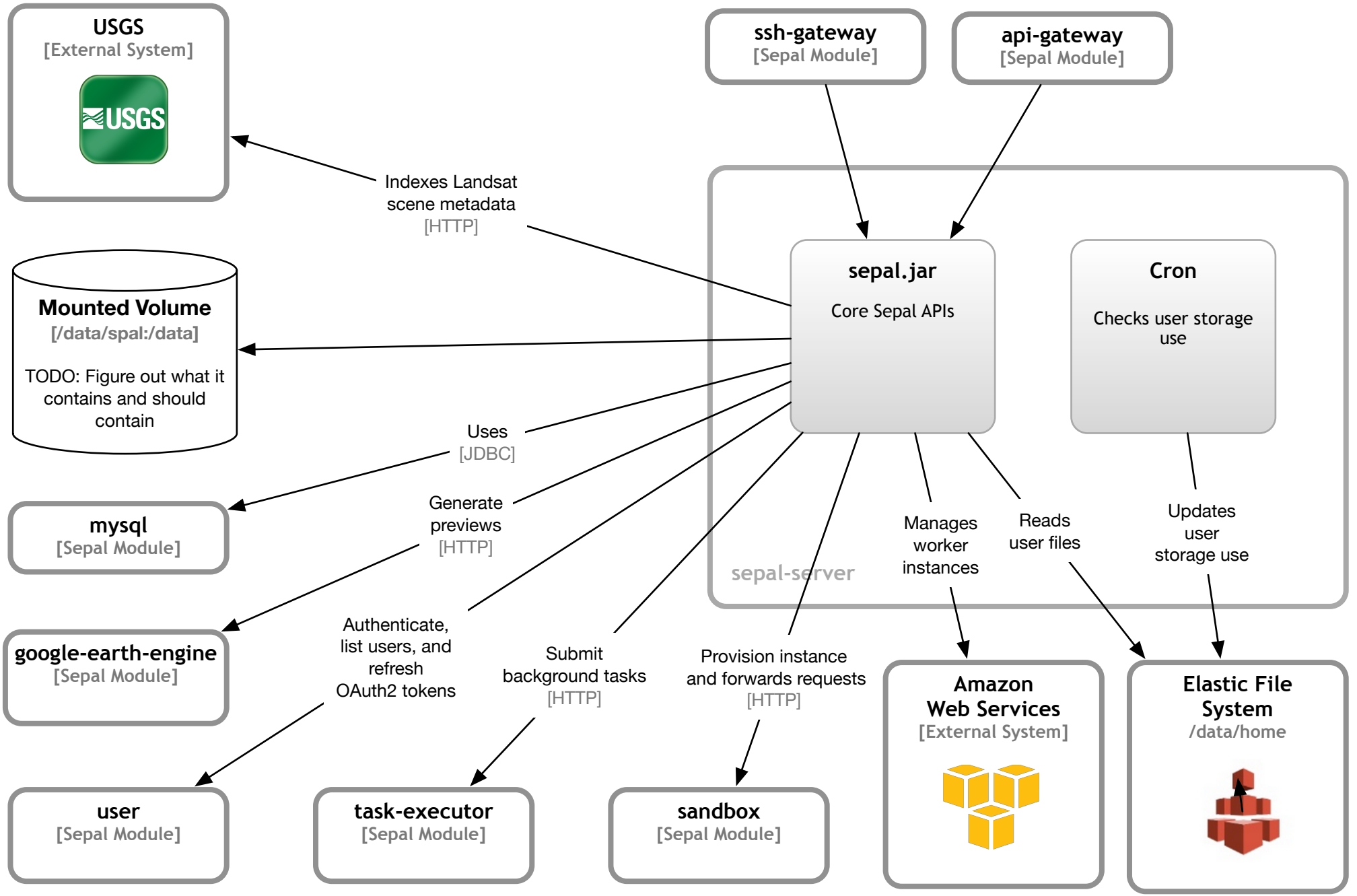

user
[Sepal Module]
sepal-server
[Sepal Module]
task-executor
[Sepal Module]
Verify that Google User have GEE access
[HTTP]
Forwards
[HTTP]
Triggers long-running GEE jobs
[HTTP]
Web Server
[Python]
Gateway to Google Earth Engine, using the Python API
google-earth-engine
Process
Retrieve results
Google Earth Engine
[External System]
Google Drive
[External System]

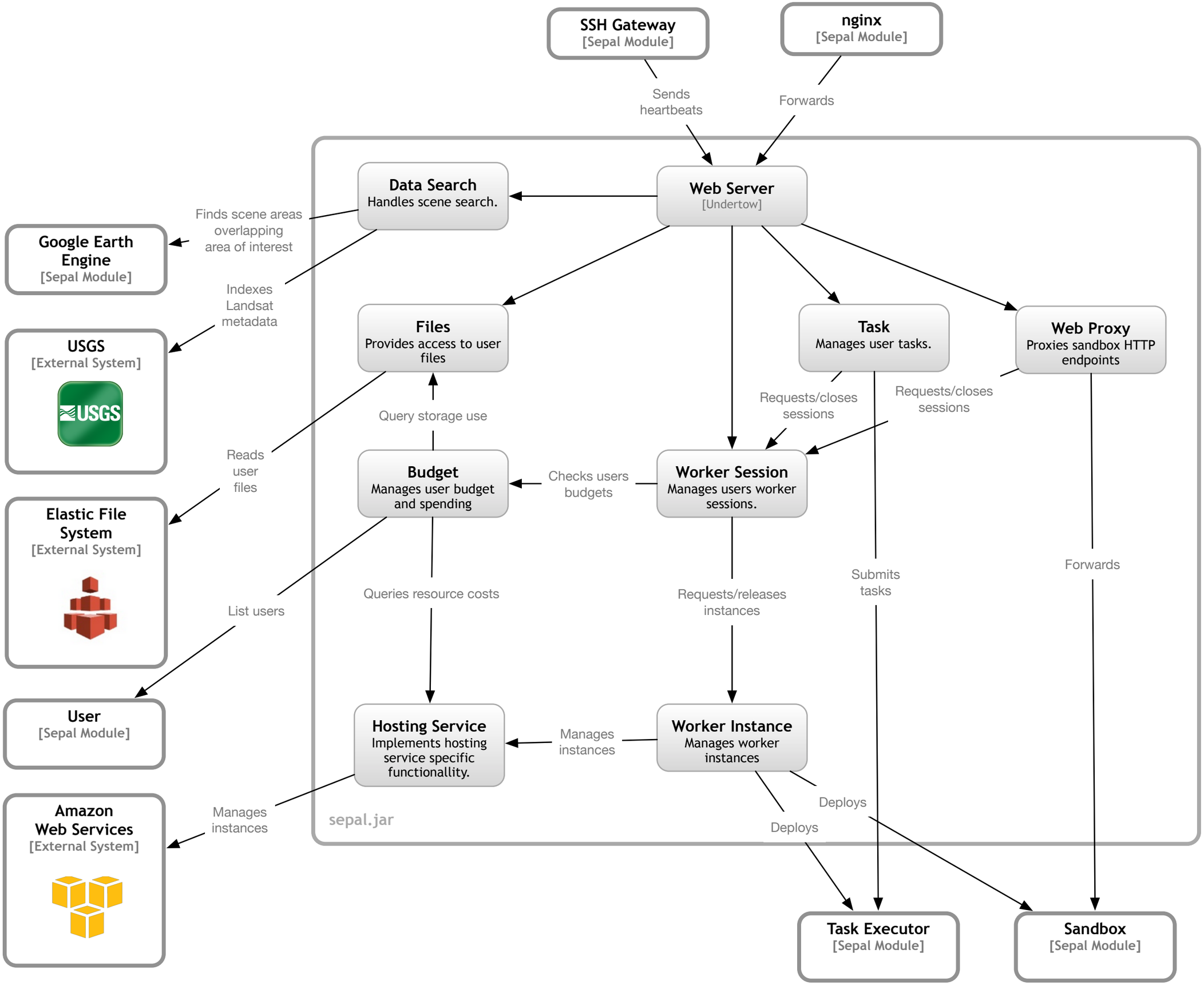

sepal-server
[Sepal Module]
user
[Sepal Module]
Contains separate databases for each module.
Tables within the sepal-server database are also only accessed from a single sepal component, in preparation for creating a database per component.
Uses
[JDBC]
Uses
[JDBC]
MySQL
Contains user related data and scene meta data
Migrates
[JDBC]
Flyway
Migrates database between releases
mysql
Mounted Volume
/data/mysql:/data
Contains initialization placeholder
Mounted Volume
/data/mysql/db:
/var/lib/mysql
Contains the database

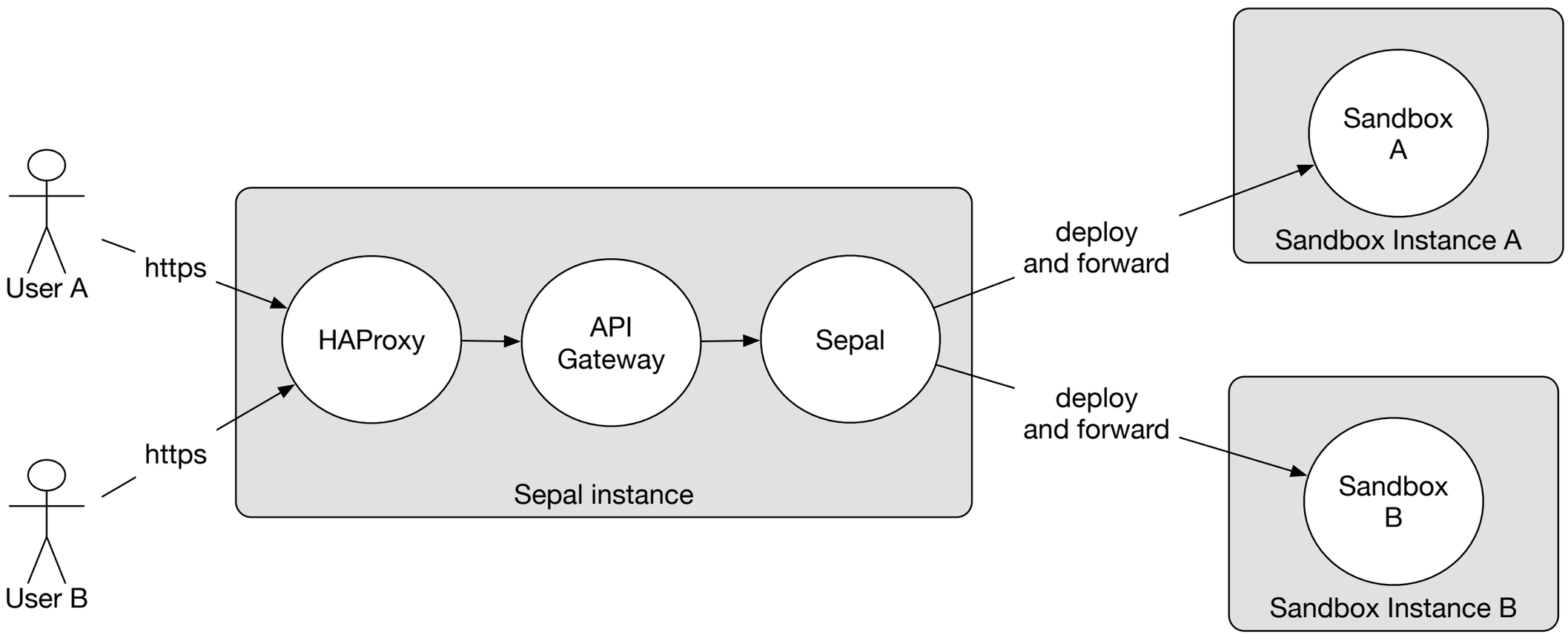

user
[Sepal Module]
ssh-gateway
[Sepal Module]
sandbox
[Sepal Module]
task-executor
[Sepal Module]
Password auth
Password auth, SSSD
Key auth, SSSD
SSSD
OpenLDAP
Repository of user account data
ldap
Mounted Volume
/data/ldap:/data
Contains certificates
Mounted Volume
/data/ldap/database:
/var/lib/ldap
Contains database files
Mounted Volume
/data/ldap/config:
/etc/ldap/slapd.d
Contains config files

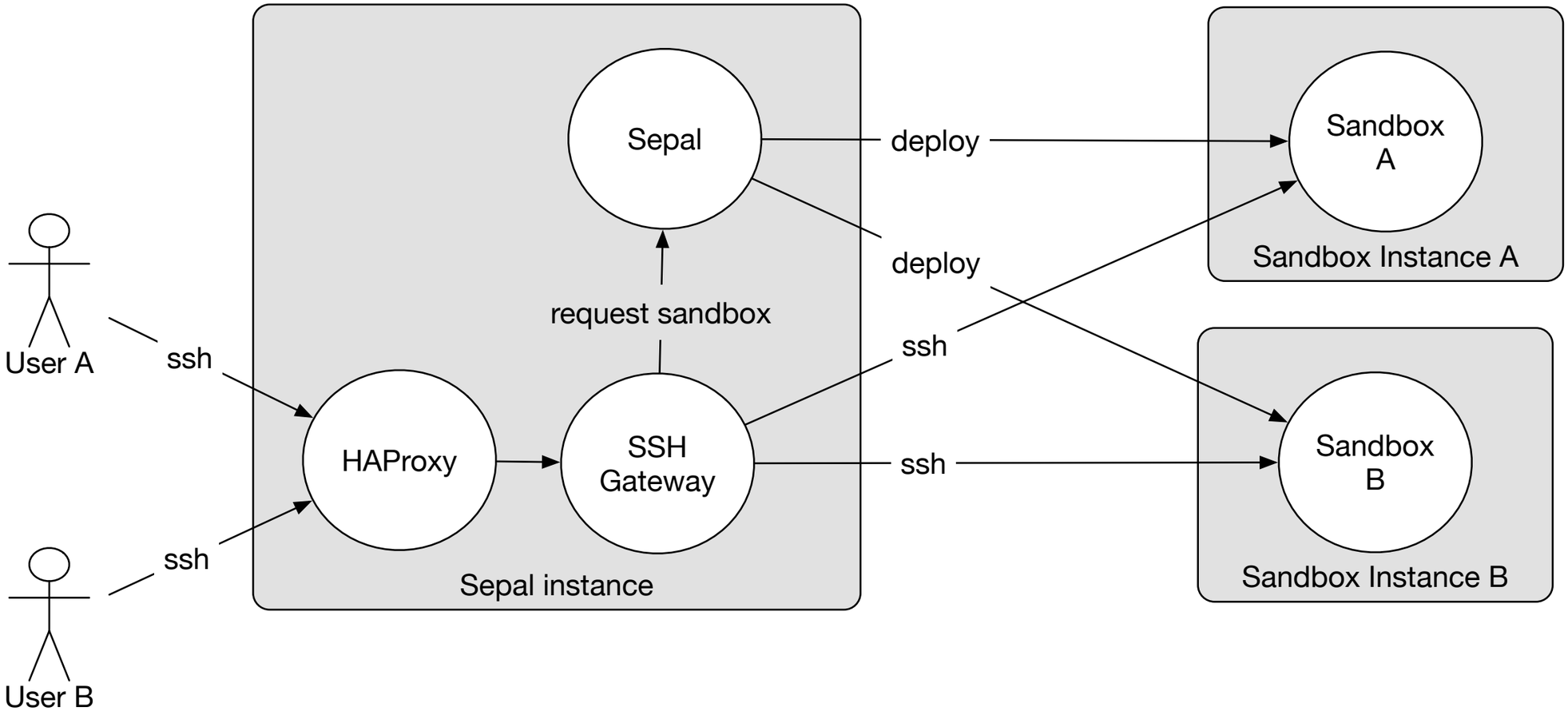

Amazon
Web Services
[External System]
ssh-gateway
[Sepal Module]
sepal-server
[Sepal Module]
Connects
[SSH]
Launches, tags,
and terminates
worker instances
Forwards
[HTTP]
Runs and
removes sandbox
containers
OpenSSH
Repository of user
account data
Shiny Server
R server for
admin deployed
apps
RStudio
IDE for R
Data viz
Image
preview
SSSD
Provides principal
identities and
performs
authentication
Docker
Repository of user
account data
runs,
removes
container
Bash
Terminal with access
to Geo tools
sandbox
Reads/writes
user files
Reads/writes
user files
Queries
Reads
certificate
Worker Instance
Elastic File
System
/home
ldap
[Sepal Module]
Mounted Volume
Contains LDAP
certificate

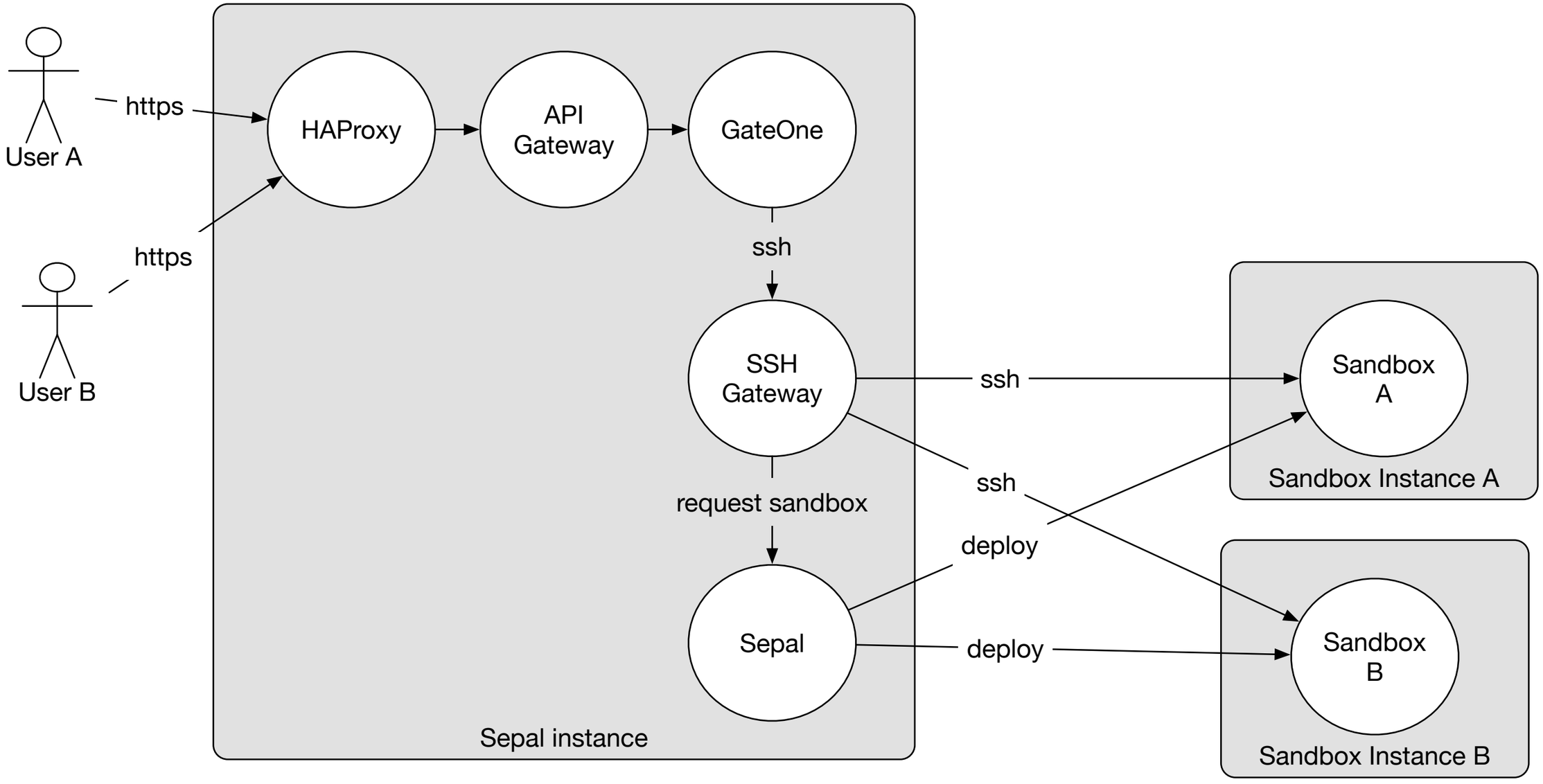

Amazon
Web Services
[External System]
sepal-server
[Sepal Module]
Launches, tags,
and terminates
worker instances
Updates
tasks
progress
Submits and
cancels tasks
Runs and
removes sandbox
containers
Google
Cloud Storage
[External System]
AWS S3
[External System]
Retrieve
imagery
Retrieve
imagery
task-executor.jar
Executes user
submitted tasks
SSSD
Provides principal
identities and
performs
authentication
task-executor
runs,
removes
container
Docker
Repository of user
account data
Worker Instance
Reads/writes
user files
Queries
Reads
certificate
Elastic File
System
/home
ldap
[Sepal Module]
Mounted Volume
Contains LDAP
certificate

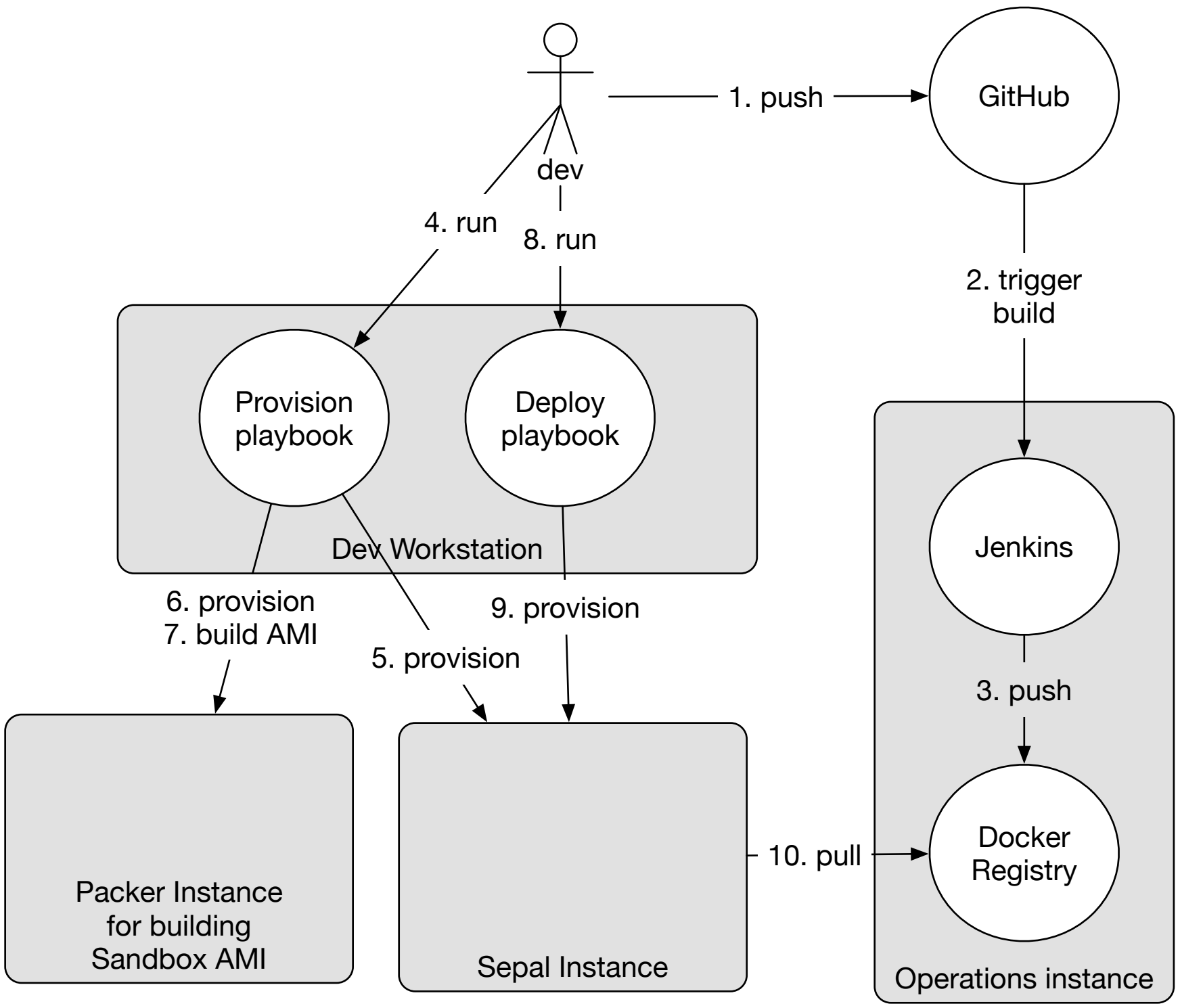

USGS
[External System]
ssh-gateway
[Sepal Module]
api-gateway
[Sepal Module]
Indexes Landsat scene metadata
[HTTP]
Mounted Volume
[/data/spal:/data]
TODO: Figure out what it contains and should contain
sepal.jar
Core Sepal APIs
Cron
Checks user storage use
Uses
[JDBC]
mysql
[Sepal Module]
Generate previews
[HTTP]
sepal-server
Manages worker instances
Reads user files
Updates user storage use
google-earth-engine
[Sepal Module]
Authenticate, list users, and refresh OAuth2 tokens
Submit background tasks
[HTTP]
Provision instance and forwards requests
[HTTP]
Amazon Web Services
[External System]
Elastic File System
/data/home
user
[Sepal Module]
task-executor
[Sepal Module]
sandbox
[Sepal Module]

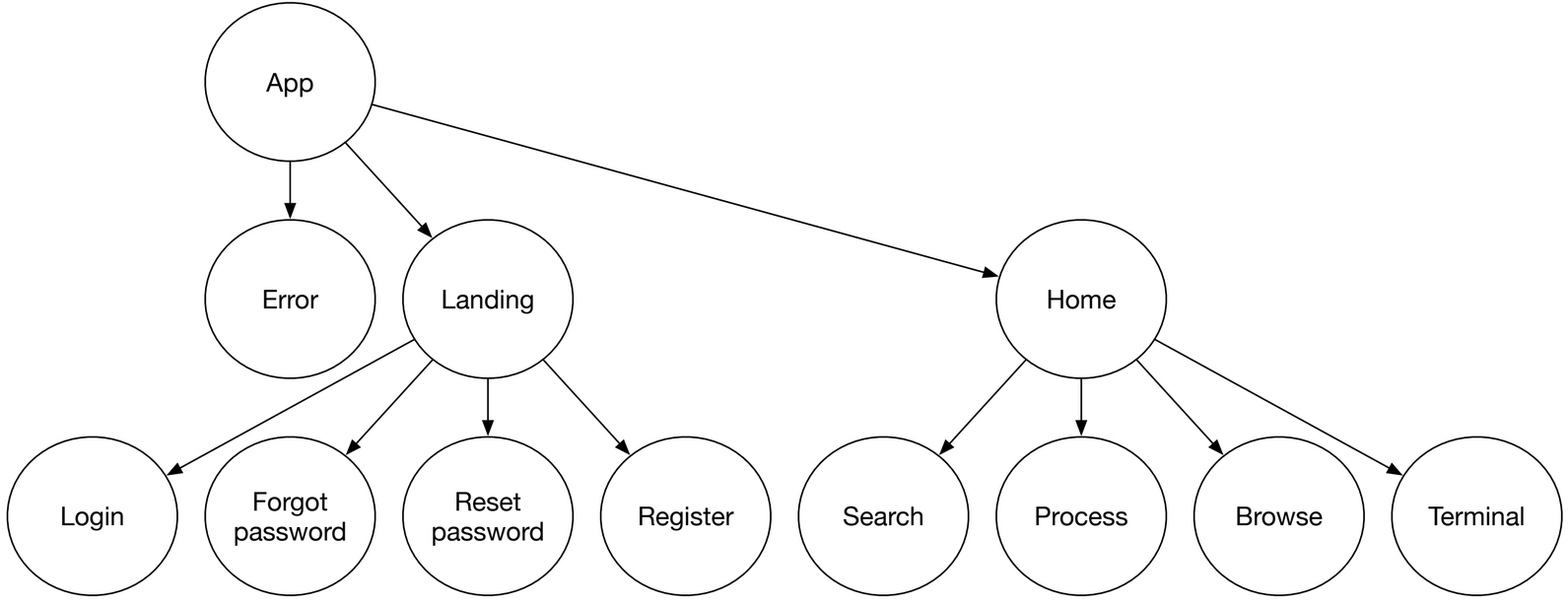

SSH Gateway
[Sepal Module]
nginx
[Sepal Module]
Sends heartbeats
Forwards
Data Search
Handles scene search.
Web Server
[Undertow]
Finds scene areas overlapping area of interest
Google Earth Engine
[Sepal Module]
Indexes Landsat metadata
USGS
[External System]
Files
Provides access to user files
Task
Manages user tasks.
Web Proxy
Proxies sandbox HTTP endpoints
Query storage use
Requests/closes sessions
Requests/closes sessions
Reads user files
Budget
Manages user budget and spending
Checks users budgets
Worker Session
Manages users worker sessions.
Elastic File System
[External System]
Queries resource costs
Requests/releases instances
Submits tasks
Forwards
List users
User
[Sepal Module]
Hosting Service
Implements hosting service specific functionallity.
Manages instances
Worker Instance
Manages worker instances
Amazon Web Services
[External System]
Manages instances
Deploys
Deploys
sepal.jar
Task Executor
[Sepal Module]
Sandbox
[Sepal Module]


User A
https
HAProxy
API
Gateway
Sepal
Sepal instance
deploy
and forward
Sandbox
A
Sandbox Instance A
deploy
and forward
Sandbox
B
Sandbox Instance B
https
User B


Sepal
deploy
Sandbox
A
Sandbox Instance A
deploy
request sandbox
User A
ssh
ssh
HAProxy
SSH
Gateway
ssh
Sandbox
B
Sandbox Instance B
ssh
Sepal instance
User B


User A
https
User B
https
HAProxy
API
Gateway
GateOne
ssh
SSH
Gateway
request sandbox
Sepal
Sepal instance
ssh
ssh
deploy
deploy
Sandbox
A
Sandbox Instance A
Sandbox
B
Sandbox Instance B


dev
1. push
GitHub
2. trigger
build
4. run
8. run
Provision
playbook
Deploy
playbook
Dev Workstation
Jenkins
3. push
6. provision
7. build AMI
5. provision
9. provision
Docker
Registry
10. pull
Packer Instance
for building
Sandbox AMI
Sepal Instance
Operations instance


App
Error
Landing
Home
Login
Forgot password
Reset password
Register
Search
Process
Browse
Terminal