The attached is the implementation. Federation, revocation and delegation are all implemented.

You need to install

1. python3
2. charm: [https://jhuisi.github.io/charm/install\_source.html](https://urldefense.proofpoint.com/v2/url?u=https-3A__jhuisi.github.io_charm_install-5Fsource.html&d=DwMFaQ&c=l45AxH-kUV29SRQusp9vYR0n1GycN4_2jInuKy6zbqQ&r=pDIGNIR4MliUVuX-Wjl7tRUZK_FNCJapwALoeFpI5Qo&m=BwPWr2Axg1CJ8yxckBegdyEpc-hrcQ3BjE_EvZL90Bw&s=bP7S7cFfKQEcMLXryilljHC8Ixz37t6-cMe-oQEQzcU&e=)
3. some other modules if you found them missing: pip3 install *module\_name*

After that, you could run the test by the following commands:

python3 gp\_setup.py

python3 federated\_setup.py

python3 federated\_keygen.py

python3 internal\_delegation.py

python3 external\_delegation.py

python3 enc\_dec\_message.py