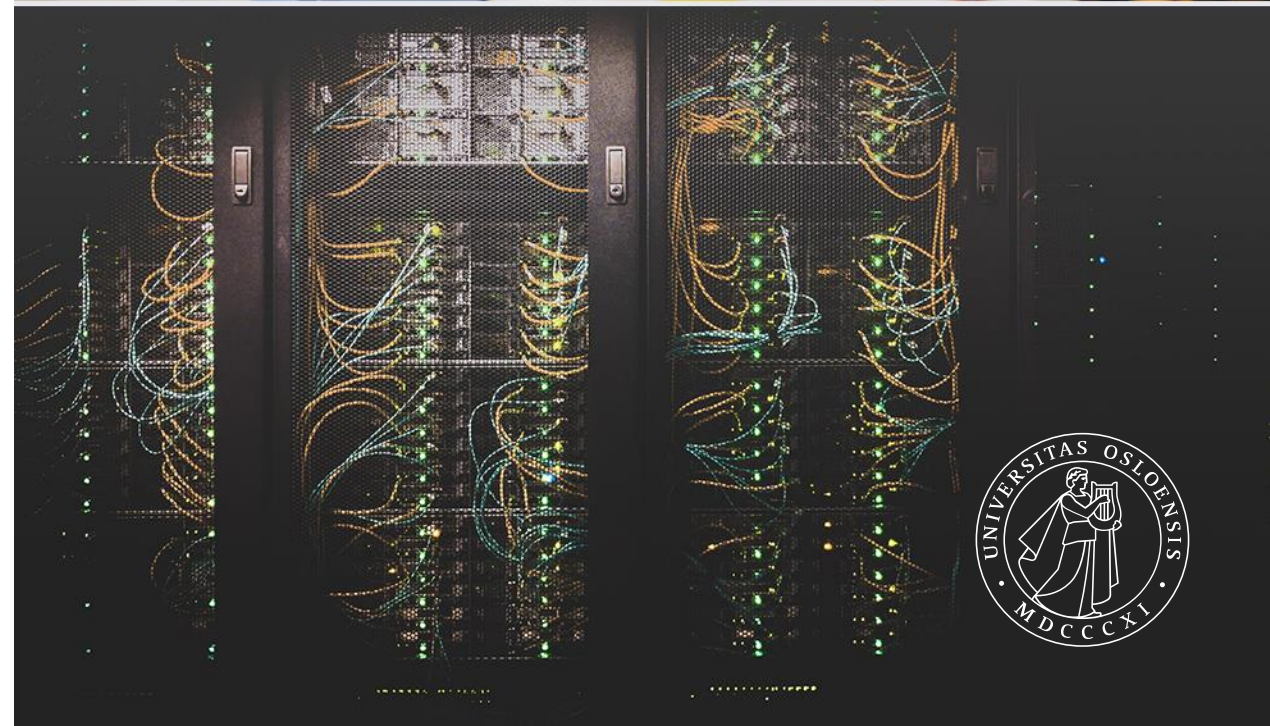# UNIVERSITETET I OSLO

UNIVERSITETETS SENTER FOR INFORMASJONSTEKNOLOGI

Educloud Research

Why Educloud Research?

UiO VDI Project

- Every user a full desktop
- World-Wide access
- Access to "Lagringshotellet"
- Flexible application methodology

TSD

- Lot's and lot's of users and projects
- Permitted for all dataclasses
- World-Wide access
- Everyone can join

but…..

- Only for UiO-users
- Legacy infrastructure

but…..

- No Internet
- Shared desktop resources
- Login is project based

Educloud

- Internet access
- Individual desktop
- World-Wide access
- Everyone can join
- One username

but…..

- No "black" data

Guidlines and requirements

"Collaborate securely with researchers on one single platform across borders."

➢UiO owned and operated (in USIT datacenters)

➢Data-centric model (all services can, if permitted, access all data)

➢Secure access (minimum two-factors ☺)

➢Self Service (portal enabling PIs and users)

➢Scalable (we hope, the future is not yet known)
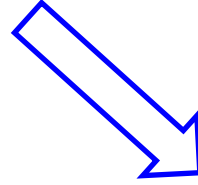
➢**We can provide advanced user support!**

Secure access to multiple services

Service 4

Service 1

Service 2

✓ A single username
✓ Password
✓ One MFA (OTP)

Service 3

Service ..N

Lot's and lot's of storage
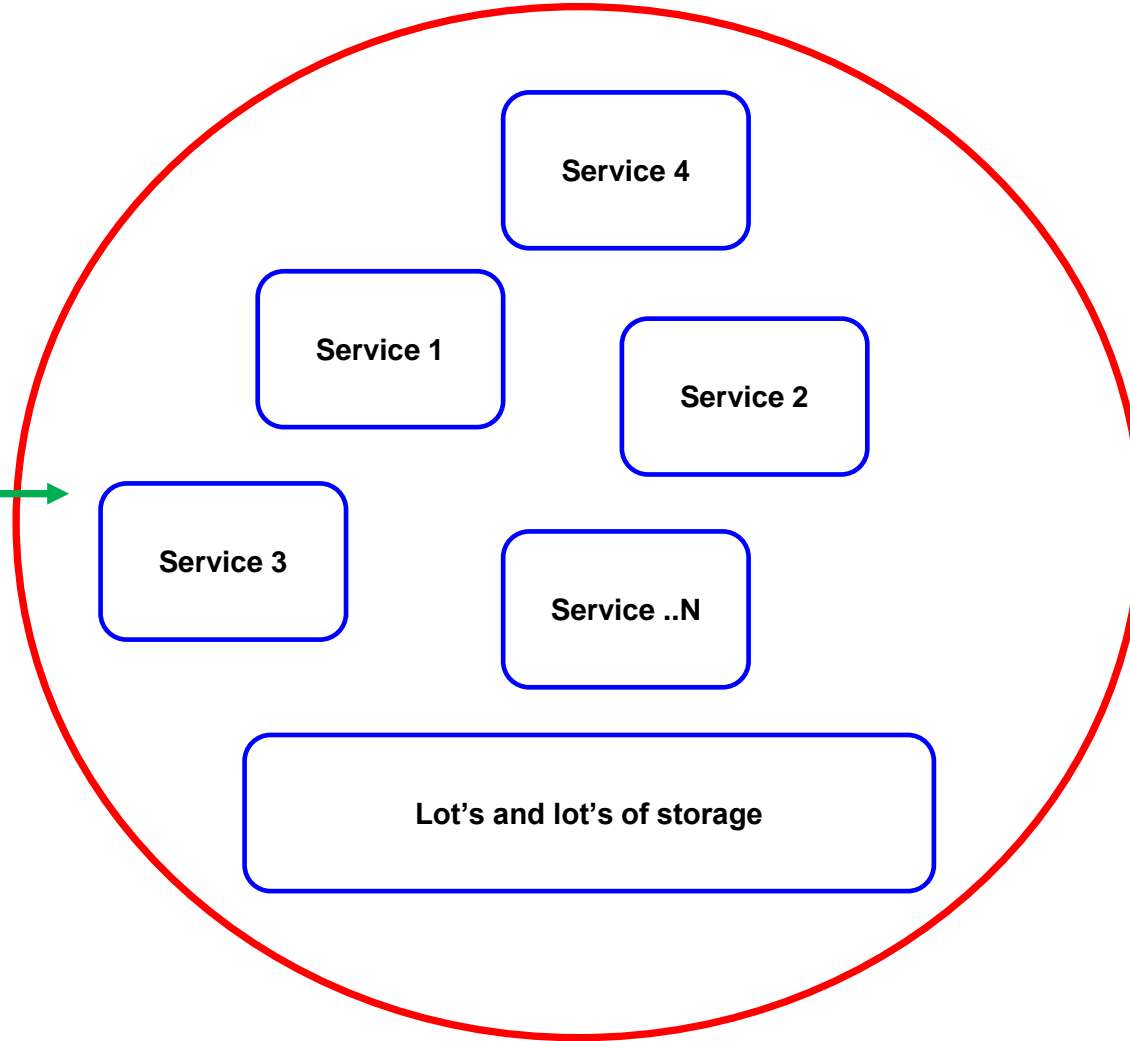
Educloud Research Vision

Educloud Research - Services

User@all-projects

On-Prem data-centric

Virtual Desktops

HPC

User-operated-services

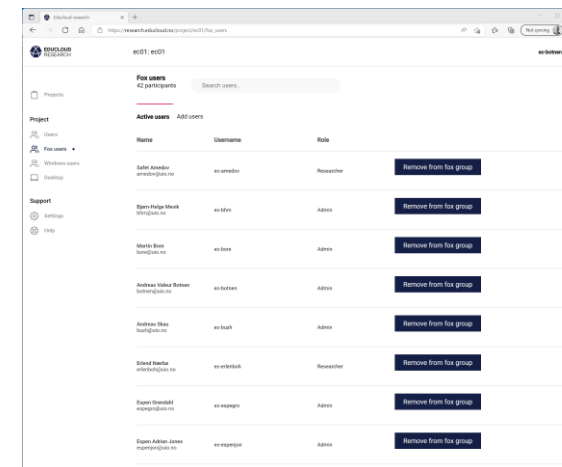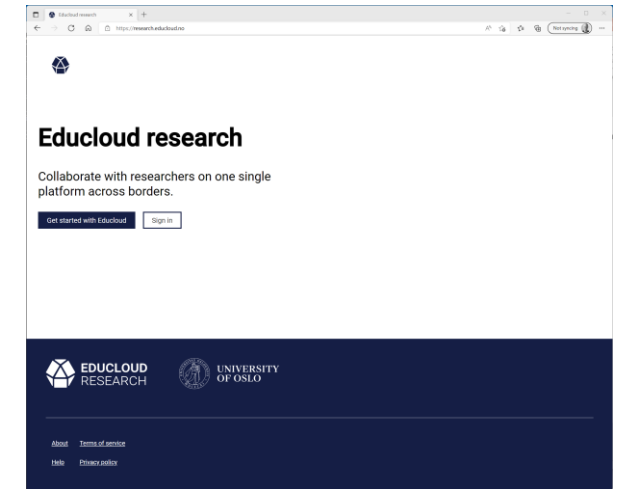User-operated-hardware

Nextcloud

FAIR

SMB/NFS-Storage

S3-Storage

Azure

NREC

UNIVERSITETET
I OSLO

https://research.educloud.no (Self Service)

✓ For all project users; PIs, admins, users

✓ Inherited **IAM** from TSD

✓ Project admins can entitle users to resources

✓ Work in progress:

   ❑ Show cost

   ❑ Assign software

   ❑ Adjust disk, cpu, memory
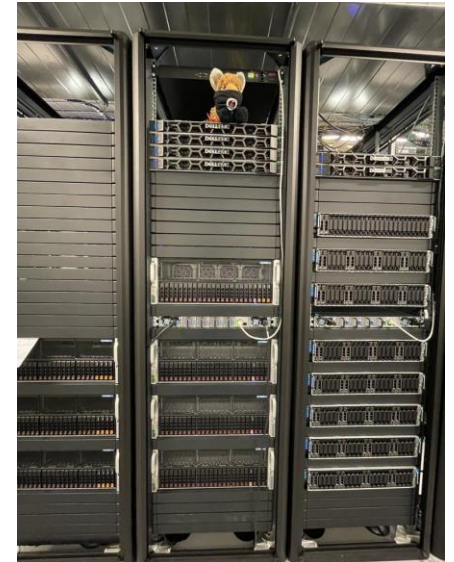
Virtual Desktop Infrastructure (VDI)

(A managed desktop that is on the Internet)

✓Similar to the setup at UiO (working on persistant)

✓Windows 2019 (will be Windows Server 2022)

✓RedHat8 (working on Ubuntu)

✓VMware Horizon to distribute the desktop

✓Highly customizable

✓RedHat8 full integration with FOX application stack

UNIVERSITETET
I OSLO
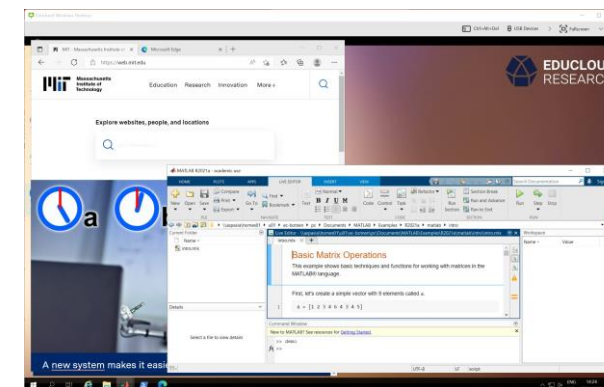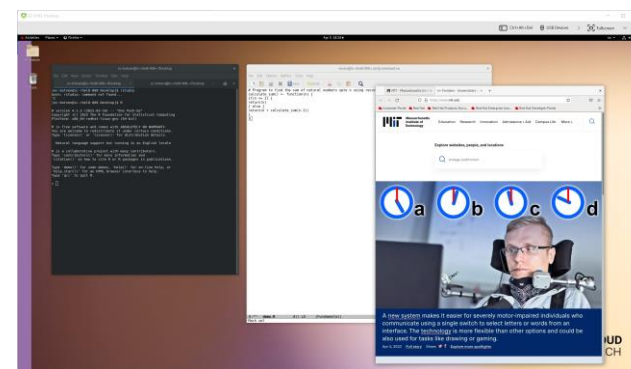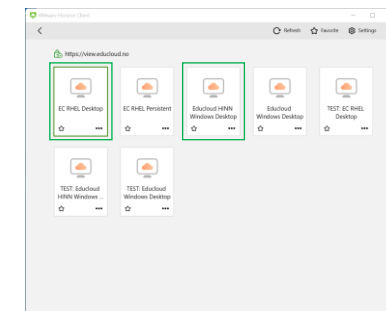
FOX (HPC)

✓ Easy access

✓ Free for UiO (compute)

✓ Interactive nodes and job-based nodes (Slurm)

✓ 3 AI nodes (4x nvidia A100 per node)

✓ Infiniband

✓ Buy your own node like NCMM and IFI if needed

VDI and HPC Integration

VDI

FOX

Nextcloud – Sync'n Share

✓ On-Prem sync'n'share

✓ EC user and credentials (again ☺)

✓ Work in progress:

      ❑ Prevent security issues

      ❑ Mounting as drive in VDI

UNIVERSITETET
I OSLO
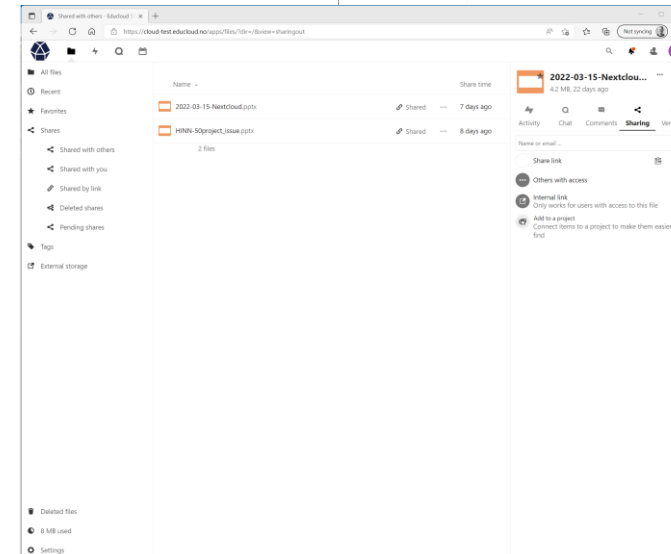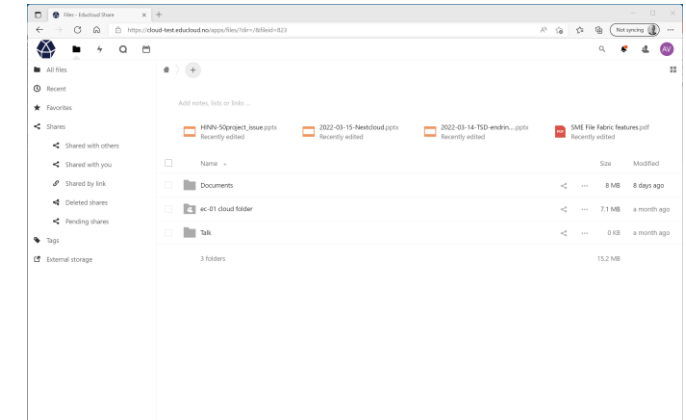
User operated – services and hardware

✓Option 1: USIT does all

✓Option 2: USIT is admin

✓Option 3: User does it all

✓Option 4: User brings own hardware

ALL management access is through ssh-login nodes or VDI

User-operated-hardware

User-operated-services
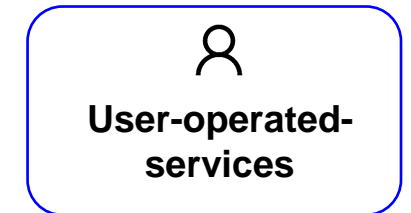
Simple Storage System (S3)

Amazon S3 – When a machine is to read or write data

- ✓ Standardized API
- ✓ Huge support base
- ✓ Very flexible

Object storage – Scalable multi-user

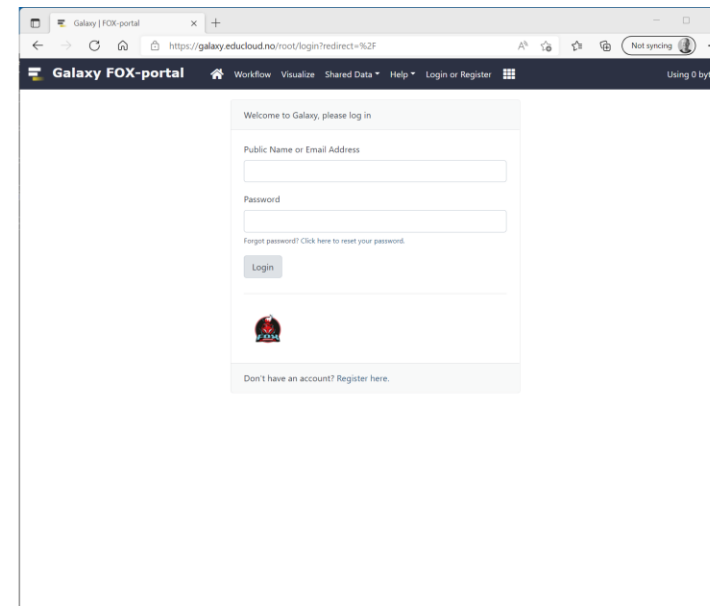- ✓ Billions and billions of unstructured files
- ✓ Scales and re-balances automatically
- ✓ High multi-user performance
- ✓ Flexible redundancy

UNIVERSITETET
I OSLO

S3 Examples in Python

Bucket

Objects (aka files)
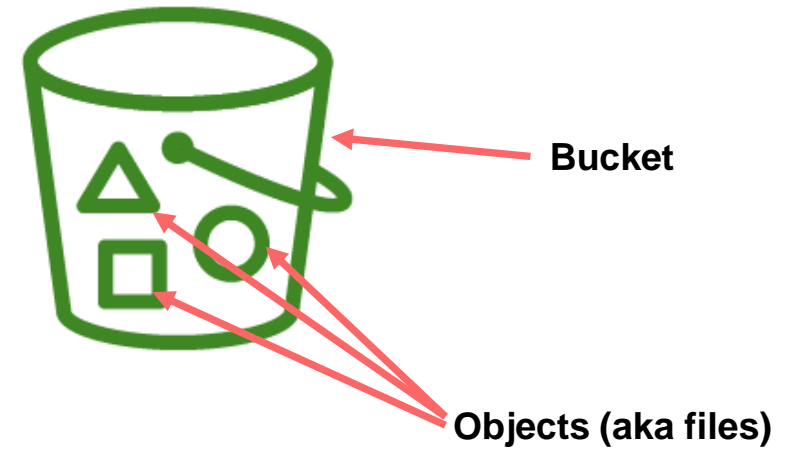
```python
import logging
import boto3
from botocore.exceptions import ClientError


def create_bucket(bucket_name, region=None):

    # Create bucket
    try:
        if region is None:
            s3_client = boto3.client('s3')
            s3_client.create_bucket(Bucket=bucket_name)
        else:
            s3_client = boto3.client('s3', region_name=region)
            location = {'LocationConstraint': region}
            s3_client.create_bucket(Bucket=bucket_name,
                                    CreateBucketConfiguration=location)
    except ClientError as e:
        logging.error(e)
        return False
    return True
```

```python
s3 = boto3.client('s3')
with open("FILE_NAME", "rb") as f:
    s3.upload_fileobj(f, "BUCKET_NAME", "OBJECT_NAME")
```

```python
s3 = boto3.client('s3')
with open('FILE_NAME', 'wb') as f:
    s3.download_fileobj('BUCKET_NAME', 'OBJECT_NAME', f)
```

Getting started

Self service portal : https://research.educloud.no/

Main page : https://www.uio.no/english/services/it/research/platforms/edu-research/

✓ Send your browser to https://research.educloud.no/

✓ Apply for a project, get an "ec"-project number

✓ Spread the word and get project members

UNIVERSITETET
I OSLO