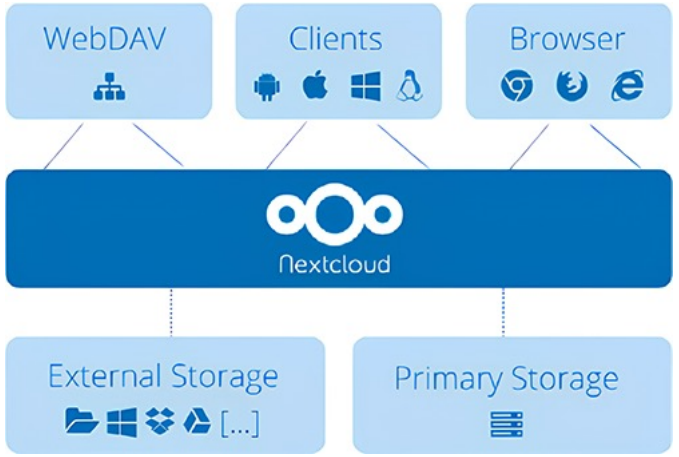
Cloud Based File Storage System via Nextcloud



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Objective

- Design Choice
- Tools and Methodologies
- Discussion on Results
- Challenges Faced
- Scalability
- Some thoughts for Improvement!!

1. Design Choice

1. **cost-effective**, secure, and flexible solution
2. **full control over data and customization options**
3. use of Docker for deployment ensures consistency, scalability, and efficient resource utilization
4. Nextcloud and Docker, you gain a powerful combination of open-source innovation and modern containerization technology,
5. **Scalability on Your Terms**:
6. Data Sovereignty and Privacy
7. **Open source and Community Support**

2.Tools &Methods

Docker-compose.yml

```yaml
version: '3'

services:
  nextcloud:
    image: nextcloud
    ports:
      - "8080:80"
    volumes:
      - nextcloud_data:/var/www/html
    environment:
      - MYSQL_PASSWORD=admin
      - MYSQL_DATABASE=nextcloud
      - MYSQL_USER=admin
      - MYSQL_HOST=db
      - NEXTCLOUD_ADMIN_USER=admin
      - NEXTCLOUD_ADMIN_PASSWORD=admin123
      - NEXTCLOUD_TABLE_PREFIX=oc_
    networks:
      - nextcloud_network

  db:
    image: mariadb
    environment:
      - MYSQL_ROOT_PASSWORD=admin
      - MYSQL_DATABASE=nextcloud
      - MYSQL_USER=admin
      - MYSQL_PASSWORD=admin
    volumes:
      - db_data:/var/lib/mysql
      - ./mariadb-init:/docker-entrypoint-initdb.d
    networks:
      - nextcloud_network

  locust:
    image: locustio/locust
    ports:
      - "8089:8089"
    volumes:
      - ./locust:/mnt/locust
    command: -f /mnt/locust/locustfile.py --host http://nextcloud
    networks:
      - nextcloud_network
    depends_on:
      - nextcloud

  cleanup:
    image: alpine
    volumes:
      - nextcloud_data:/var/www/html
      - ./cleanup.sh:/usr/local/bin/cleanup.sh
    entrypoint: ["sh", "-c", "while true; do /usr/local/bin/cleanup.sh; sleep 3600; done"]
    networks:
      - nextcloud_network

networks:
  nextcloud_network:

volumes:
  nextcloud_data:
  db_data:
```

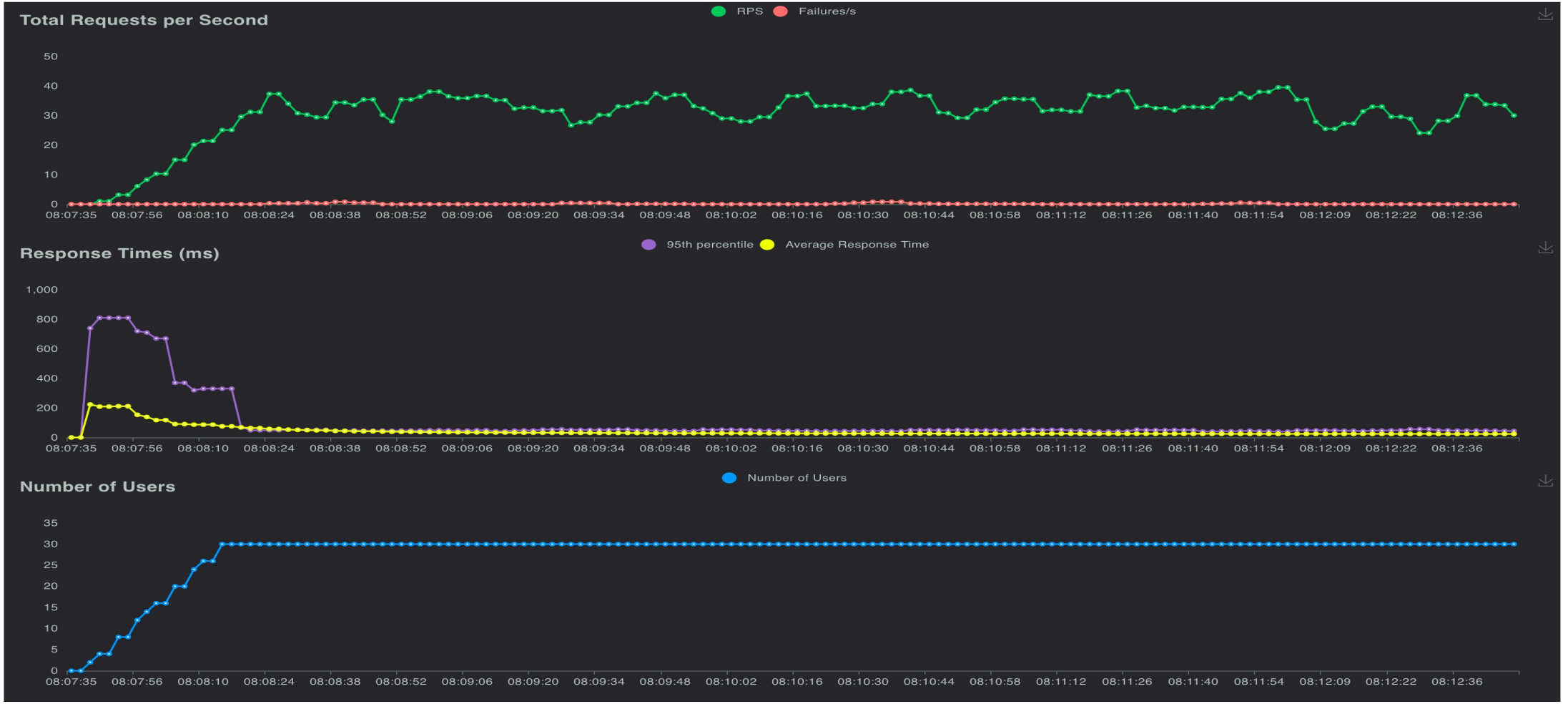
Security measures

- Enable server-side data encryption
- Stronger password requirements
- Possibility to enable two factor authentication

```
docker exec --user www-data cloudbasicproject-nextcloud-1 /var/www/html/occ app:enable encryption
docker exec --user www-data cloudbasicproject-nextcloud-1 /var/www/html/occ encryption:enable
echo "yes" | docker exec -i --user www-data cloudbasicproject-nextcloud-1 /var/www/html/occ encryption:encrypt-all
```

3.Locust Tests

1Mb file Get/Put/Delete (30 users)



1 mb file comparison between 3 runs(users-30/20/10)

- 5Mb file across 3 runs(10/20/30 users)

4. Challenges

- Container Identification issues
- Nginx configuration issues
- Locust Testing Challenges-HTTPError('404 Client Error’), HTTPError(‘423 Client Error’)
- Storage issues on container side

5.Scalability

- Horizontal Scaling
- Vertical Scaling
- Load Balancing
- Caching
- Auto Scaling
- CDN

6.Future improvements

- Use tags for testing different kind of files instead of editing the locust file each time.
- Explore options for seamless integration with other cloud services and platforms for different business cases
- Consider integrating with dedicated monitoring platforms like Prometheus, Grafana, or ELK Stack for more advanced monitoring and visualization capabilities.