
ISM 324 and CSC 580

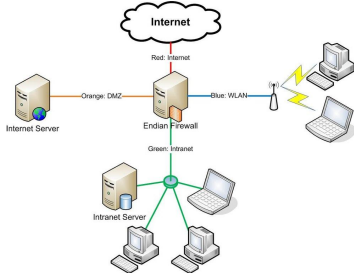
Collaborative Project Meeting

Introduction to Cloud Computing and Storage

January 16, 2018

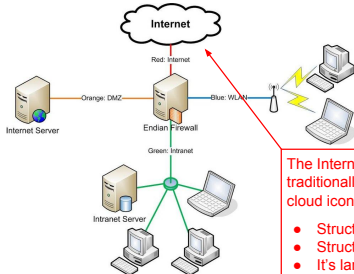
What does “the cloud” mean?

An example of a typical network diagram:



What does “the cloud” mean?

An example of a typical network diagram:



Cloud Computing / Services

Definition: Using remote, Internet-based servers for computational or storage resources.

Some benefits:

- Accessible from anywhere, any time
- Maintenance done by someone else (unless self-hosted!)
- Cost-effective, as part of a shared data-center
- Scalable resources

Some drawbacks:

- Availability relies on Internet connection and server reliability
- Long-distance communication creates a performance hit
- Your data is on someone else's machines (unless self-hosted!)
- Co-located with others - maybe even competitors

Trust is key!

Cloud Computing

Idea: Computational resources that run your programs are located and managed remotely.

Some examples:

- Amazon EC2 (Elastic Compute Cloud)
 - <https://aws.amazon.com/ec2/>
- Microsoft Azure
 - <https://azure.microsoft.com>
- Google Cloud Platform - Compute Products
 - <https://cloud.google.com/products/compute/>

Many services have a "free trial" account, or even free student accounts!

Cloud Storage

Concepts

Idea: Your data / files are stored on a remote server (not a computational service - just storage!)

Two main models:

File sync

- All files on local sys and server
- Both monitored for changes
 - Local file change → Upload
 - Server file change → Download

Ex: Dropbox desktop sync client

File stream

- Files not generally on local system
- File-by-file access
 - Limited local storage during use
 - Download/use/upload

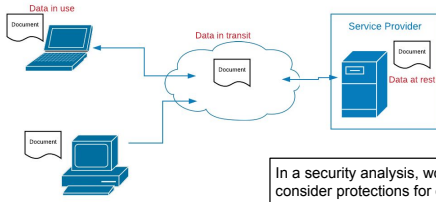
Ex: Google Drive streaming

Note: Kumo @UNCG makes files available as virtual drives

Cloud Storage

Simple Model

Think about: Where is data in the system?



In a security analysis, would consider protections for each data location and context.

Cloud Storage

Examples - Mainstream Providers

<ul style="list-style-type: none">• First widespread system• Released June 2007• Created by 2 MIT students• Broadest support• Personal, premium, and business accounts• Over 500 million users	<ul style="list-style-type: none">• Started in 2004• College project @USC• Powerful sharing settings• Support on all but Linux• Workflow support• Business policy support• Over 50 million users
<ul style="list-style-type: none">• Tightly integrated w/GSuite• Good sharing w/Google accts• Support on all but Linux• Supports HUGE files (5TB)• Over 800 million users	<ul style="list-style-type: none">• Tight integration in Win 10• Great integration w/Office365• No file versioning• Some cross-platform support• Over 115 million users (?)

UNCG users have unlimited storage on Box and Google Drive, and 1TB on OneDrive

Cloud Storage

Example - Nextcloud

Free, open-source system

- Server is simple PHP web application
- Sync clients for:
 - Windows, OSX, Linux
 - Android, iOS, Windows Mobile
- Company/development is funded by support contracts



Security advantage of open source: Anyone can audit!

- But: Because people can, doesn't mean they will!
- ... in CSC 580 we will! (at least partially...)

Still a matter of trust!

Upcoming version (13.0) will support end-to-end encryption

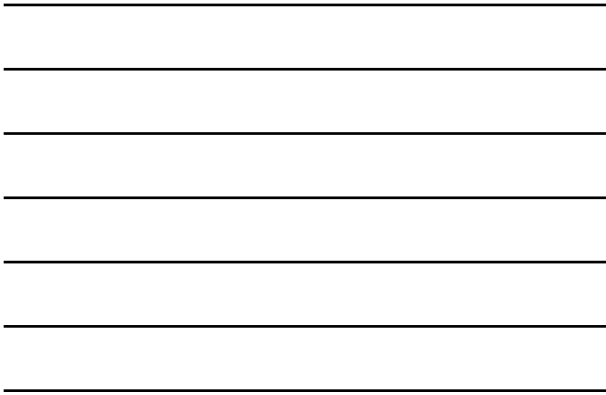
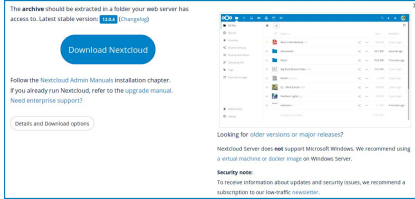
- E2E encrypted data never leaves device unencrypted
- Version 13.0 currently at "release candidate 1" level

Cloud Storage

Nextcloud - Usage model 1: Get the software

Download the software, run it on your server...

- If on your server: No cost after buying hardware (IT staff?)
 - ... can use a remote managed server (e.g., Amazon EC2)
- All data stays on your equipment and in your control
- But: Must install, maintain, backup, patch - all yourself



Cloud Storage

Nextcloud - Usage model 2: Buy a dedicated device

Buy a box and plug it in!



Nextcloud Box

The Nextcloud Box comes pre-installed with Nextcloud, running on Ubuntu Core (based on the new super secure, remotely upgradeable Linux app packages known as Miraki) on the OS.

The Box consists of a 1 TB USB3 hard drive from WD, a Nextcloud case with room for the drive and a complete board, a microUSB charger, cables and adapters, an external drive and extras.

The Box is compatible with the Raspberry Pi 2 (not included). Support for other boards (e.g. Raspberry Pi 3) is coming soon.

[Learn more](#)

Goal is plug and play

- Reality: Not quite...
- Access from anywhere
- Data on your devices



Spreedbox

Behind the award-winning designed device by vertikal AG operates a secure video chat and the exchange solutions for small enterprise usage.

It offers Strong and so on and encrypted audio and video chat, a Newsboat based file sync, an IRC solution and advanced security features with a silicon hardware key generator.

The Spreedbox offers an optional SIP gateway, enabling web conferencing participants to dial in through a traditional telephone connection.

[Learn more](#)

Note: Some similar proprietary solutions:

- Seagate Personal Cloud
- WD My Cloud

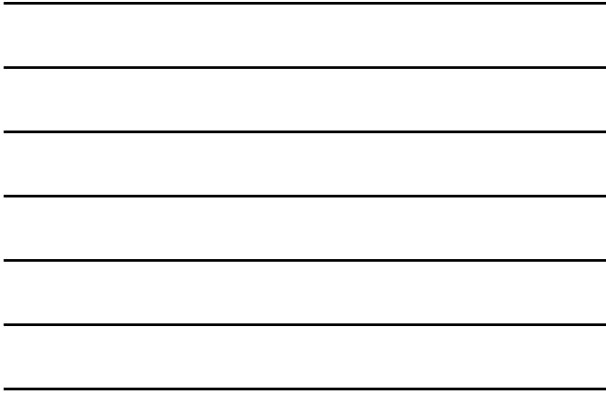


Synccloud

Synccloud is a home server device which fully supports Nextcloud.

It features easy installation and automatic selection of hardware among 100 boards, easy use of external hard-drives for storage, domain name for device and access to device through internet, automatic HTTPS setup and more.

<https://nextcloud.com/devices/>



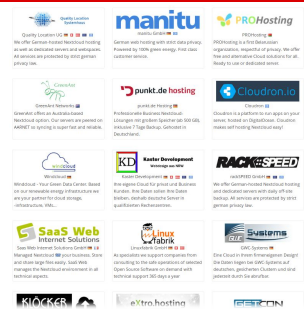
Cloud Storage

Nextcloud - Usage model 3: Get a service provider

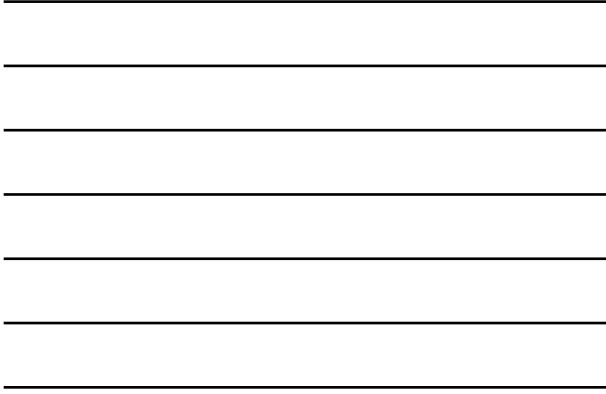
True 3rd party cloud (like Dropbox, etc.)!

Over 50 different providers

- Different service levels
- Free - Enterprise
- Different locations



<https://nextcloud.com/providers/>



Demo....

Live demo of Nextcloud

And if that doesn't work... a pre-recorded demo

<https://youtu.be/BgjTHdzYC5w>
