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COMPARISON AND IMPLEMENTATION PLAN OF A FILE TRANSFERRING SERVICE

Bachelor's thesis
Information Technology

2022

South-Eastern Finland
University of Applied Sciences

South-Eastern Finland University of Applied Sciences

Degree title	Bachelor of Engineering
Author (authors)	Ossi Nissinen
Thesis title	Comparison and implementation of a file transferring service
Commissioned by	Blancco Oy
Time	2022
Pages	29 pages, 1 pages of appendices
Supervisor	Matti Juutilainen

ABSTRACT

The objective of this thesis was to compare file-transferring methods and create an implementation plan of a suitable service for Blancco to be used in production, development and customer file sharing. The thesis covers the steps starting from garnering information and use-cases around the company to then compare products with Blancco's requirements. With this information we could also create a technical plan to cover how the service should look and work like, and go over the general steps in its implementation.

In order to understand the methods and technological terms that is used for proper file-sharing by the industry leading standards, the theory of them are also covered.

File-sharing services can be interpreted as different Software as a Service (SaaS) products such as collaboration tools, Cloud storage and software delivery tools. In Blancco's use the right products were researched as the use-cases are very specific consisting of customer uploads, product integrations, internal file-sharing and product delivery. In order to have complete understanding, the benefits of using Cloud or on-premise solutions are also covered.

The benefit to this project at its completion were quite noticeable as the old method of doing this was unfit for Blancco's modern security requirements and company size. Most importantly, the security improvements and efficiency of a more modern solution is a big benefit for Blancco in the long-run.

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1 INTRODUCTION

Blancco Technology Group is a software company with products relating to data sanitization and hardware diagnostics. It currently employs over 300 people and has customers globally. The operations of Blancco began in 1999, when it was founded in Joensuu, Finland by Kim Väisänen and Janne Tervo. Since then it has grown to an industry leader in data sanitization software, hardware and system diagnostics.

Blancco has been using an in-house solution for file sharing within the company and customers for a long time. Recently, this method has proven itself slow and unsecure as the size of the company has grown, along with the amount of sensitive data that has to be stored. The aim for this project is to find a new solution that can provide a unified and secure system that can be used company-wide. Currently, the used in-house solution offers little to no integrations for other services that are in use, like in-use user management tools, Single Sign-On or the required security features for it to be ISO 27001 certified.

The need for an updated solution came from the requirements that are set by industry certifications that Blancco wants to adhere to, such as the ISO 27001, which is a requirement for the service. Also, the individual requirements from different departments of Blancco to use the product efficiently for their specific use-cases, and with the proper features and integrations to assist a smooth transition from the old solution to this new one.

This thesis will consist of two major parts. The first one is the product comparisons in order to find the best solution for Blancco’s use and budget, second is the technical plan and implementation plan for when it is time to make this start the implementation of this project. In order for the plan to be suitable for multiple services instead of focusing on one as the selection of the provider isn’t within the scope of this thesis, the implementation plan will be defined with that in mind.

2 THEORY

File sharing is a broad concept, and it means the transferring of data between two parties, such as two computers. This kind of data transfer where one party has the local data and directly sends it to another party, is often referred to peer-to-peer or P2P. When the idea is expanded, the data could be located on a server and be accessible by multiple other parties, through a protocol such as FTP (File Transfer Protocol).

For a regular individual user this can be an efficient way to share some documents or data in an efficient manner, but for an organization with hundreds of employees and the need for security it is a bit more complicated. As the surface area of these systems expands, the threat of data breaches and data loss increases, so more security measures need to take place in order to prevent this. This includes proper authentication methods, encryption, data and user logging, IP blacklisting etc.

However, if these are done properly, in a company environment the advantages can be big. There will be unified access globally, ease of collaboration, data loss will be mitigated, and there will be a trail of every piece of data that comes through the systems. There are benefits for both the company, and the employees.

2.1 Product integrations

The internal integration requirements to other systems are to have something that enables a connection from Blancco's user management tools to the service, with a protocol such as SAML and then provide a Single Sign-On (SSO) for said users. This would then be in line with other services Blancco uses that have the same capabilities, and will improve the user experience and security of the environment. Additionally, having the user accounts synchronized from Blancco's user management tools allows new employees to have immediate access to the system just as long as they exist on the user management tool.

Other types of integrations that are more external are the product integrations that the actual software Blancco offers has, such as over-the air (OTA) update

servers. This kind of external product integration will be done directly in the source-code of our software and tools with API or SDK tools so there aren't necessarily more requirements other than having API that is capable of doing the simple things that's needed, such as downloading and uploading files. This step of the project is also something that will be worked in conjunction with the Development teams in the company.

2.1.1 Single sign-on

Single sign-on, or often referred as SSO, is an authentication method which allows the employee to use a single identification to use a multitude of services that are integrated with Blancco's environment. The need for SSO mostly stems from the ease of use that it provides, as users no longer have to remember multiple usernames and passwords, which in tun reduces helpdesk costs and improves network security.

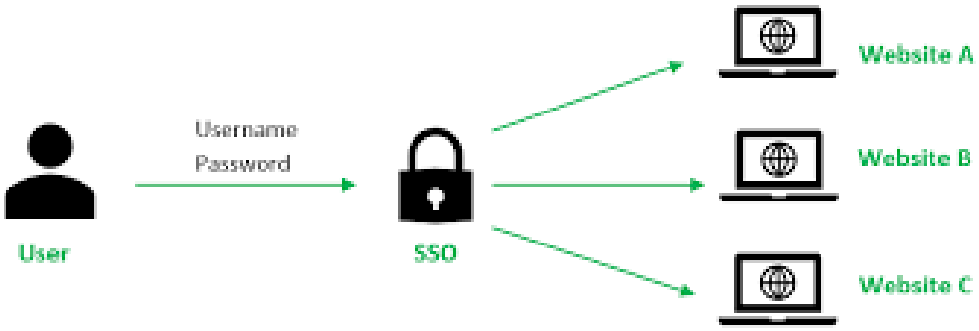

Figure 1. SAML authentication diagram

How an SSO works is very straight-forward, whenever a user logs in to a service with SSO enabled, an authentication token is created for the user which is saved in the browser's or the service's server. This token is used for authentication within these services, meaning that the user's credentials are not remembered but as the token is valid, access can be granted to SSO services which is depicted in Figure 1 (What is SSO? | How single sign-on works, n.d.).

2.1.2 SAML

Security Assertion Markup Language is a very common standard used in authentication and authorization between systems and services. This is an essential part to the previously mentioned SSO, SAML has an excellent Web Browser SSO profile that can grant access by saving information in the browser cookies for SSO (Ingalis, 2002).

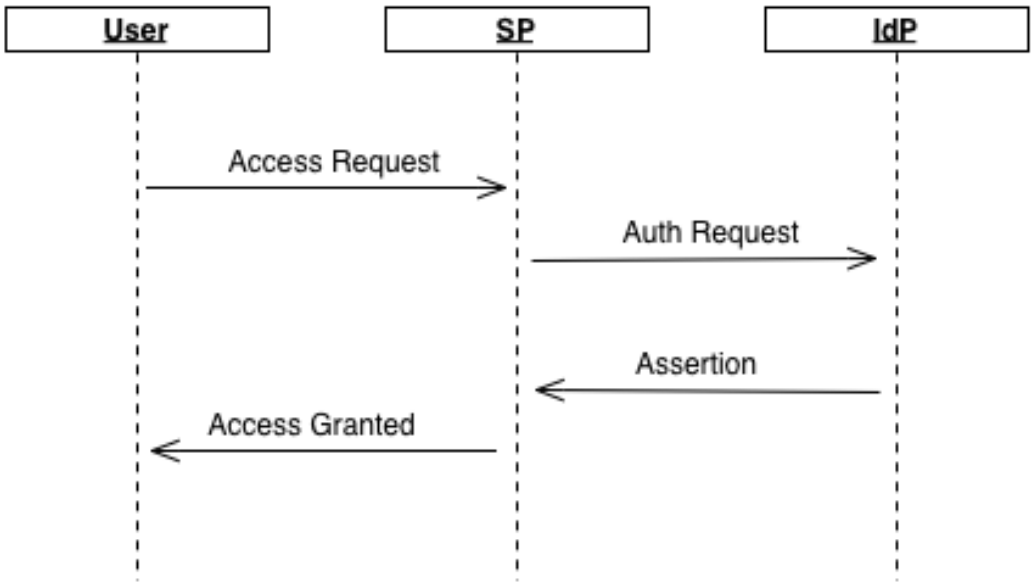

Figure 2. SAML diagram

Figure 2 depicts the steps taken between the user, the service provider (SP) and the identity provider (IdP). SAML's operations are easily covered in 3 steps:

1. Someone requests access to a service,
2. Service asks identity provider for confirmation on the access request's authentication information,
3. Service makes a decision based on the identity provider's answer to grant access or not.

2.1.3 Application Programming Interface (API)

API is a set of rules and instructions that a program or software might offer for external integration (Lane, 2019). This can for example be used by a client requesting some type of information from a server using their API, and the

server responding accordingly. In the integrations that Blancco would be using, one example would be one of our programs asking the file-sharing service to download some file or upload something into a folder. This can be performed by using the API provided by the service or even in some cases a software development kit (SDK) which uses API but is frame-worked to work specifically on different programming languages. This means that the API control can be hard-coded within the software with the appropriate language for maximum integration between the software and the service.

2.2 Data encryption at rest

The industry standard for most SaaS -solutions has been AES 256-bit encryption which stands for Advanced Encryption Standard that generates a 256-bit encryption key. When data arrives to rest, it will run 14 rounds of algorithmic steps to produce an unreadable ciphertext of the data (Advanced Encryption Standard, 2022).

It has been calculated that using ‘brute-force’ to crack the encryption key, which means attempting every possible combination would take with a modern supercomputer about 27 trillion trillion trillion trillion years to crack. By this counter-measure the data should be safe from anyone gaining access to it as long as the encryption key is not discovered (How long would it take to brute force AES-256? 2016).

2.3 Data encryption in transit

Any data coming or going to a server, will be encrypted ‘in-flight’, meaning that if the data was to be intercepted by a third party, the encryption would block the ability to view the data. Common methods to encrypt data are Transport Layer Security (TLS) or its predecessor Secure Socket Layer protocol (SSL). These are quite relevant terms in information technology in general, as the most commonly known use of TLS is HTTPS which is quite literally the foundation of network communication on the internet. The non-secure version of HTTPS that does not use TLS or SSL is known as HTTP. These transit protocols encrypt the data on the way to our service but it should be noted that they

will not be encrypted when they arrive, so that is why a separate encryption method is required for stationary encryption (Transport Layer Security, 2022).

To operate, SSL and TLS authenticate both the sender and recipient of the data. The data is sent in small parts and each part is encrypted with its own key which both the sender and recipient know. When the sender sends the data, it encrypts it with its own key and the recipient decrypts the data with theirs.

3 CHOOSING SERVICE PROVIDER

The majority of the work in the planning phase for this project is finding the correct service provider for Blancco, which would check the most boxes in their uses. In order to filter out the best options, four leading solutions were picked based on their marketing material and merits found on their websites. These are Files.com, Owncloud, FileCloud and Egnyte. The selected services were compared to the requirements of Blancco, and against each other.

3.1 Usage survey

As the current FTP-service that Blancco uses does not have any logging data and it is used widely around the company, a questionnaire was sent to team leads in every department at Blancco to scope out use-cases, requirements and other determining factors in what is required of this new service to be operational for them. Responses are from Sales, IT, Support, Research & Development, Marketing and HR.

The questions were sent via Microsoft Forms and consisted of confirming that there is uses in their respective team, which kind of requirements they have, and what additional features they would like to see in the future. The questionnaire form allowed for the questions to be presented in a logical manner so that users that don’t use the service, wouldn’t receive further questions. The complete questionnaire is represented in Appendix 1.

The question number 5 includes assumed responses that the users would require, but question 6 provided interesting information that can used in our research and product comparisons.

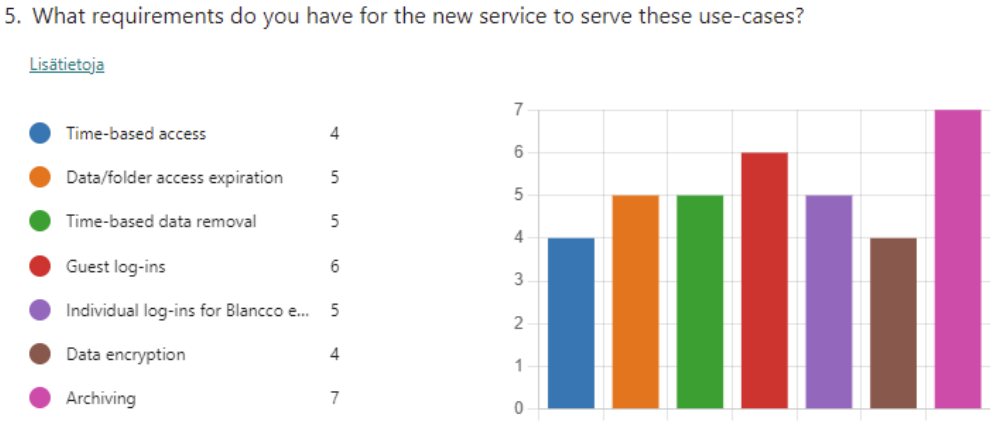

Figure 3. Top requirements based on the survey

Archiving came out as the top answer based on all the responses, this is likely due to the lack of any type of archiving on the previous file sharing method, which has lead to there being some outdated data.

6. Are there any additional features you need or want that weren't mentioned in the previous question?

5 Vastaukset

ID ↑	Nimi	Vastaukset
1	[redacted]	We have been using [redacted] for QA purposes too. For example when testing in Windows PE it's easy to access that share from the booted up Windows PE environment to bring file over or use software directly from network share instead of creating a new image with those files / sofware or copying them with removable media.
2	[redacted]	FTP Access
3	[redacted]	Mainly would need public file sharing. Would be nice to have access to edit and manage the folder structure for IT. Access to the service (user/admin) should be managed a bit better than with old system (zero trust concepts)
4	[redacted]	We need to be able to upload the images via API/FTP or something equally simple automatically from our Jenkins servers and other generators like dedt. Image should be able to be available at least one year, but longer is better.
5	[redacted]	Just as a side note - Currently if you have a Video in download.blancco.com and you hit the link, it opens the video in a browser and plays it using the browser video player (rather than downloads it). I think this behavior should remain the same in the new service.

Figure 4. Additional requirements from the survey

The data from the 12 responses for this survey included information we already had in mind, but a few new key details that would be needed to take into consideration. An important take away from it was the use for research & development teams, which have some automation in order to export and import data from the current service, either via API or URL to ensure communications with their products. These will also need additional testing during the proof of concept phase of the project so that we can ensure compatibility and how it works.

3.2 On-premise or Cloud-based

Before comparing products and options, it should be discussed whether the solution should be an on-premise server handled by Blancco IT, or whether it would be worth moving to a completely Cloud-based service handled by an external entity.

Cloud-based file sharing has a strong base for a good solution as this technology has only been improving during the last years and there is more and more companies taking this approach. First is the cost, in a standard contractual scenario when using a Cloud service, you only pay for the storage and bandwidth you use. This can easily be scaled up or down to fit the user's requirements without a big investment monetarily or time wise. These solutions are often offered by well-known industry leaders so they are very reliable and should provide the best security possible always, although these matters are beyond the customer's control. When these points are taken into consideration, a Cloud-based file-sharing service is just a very convenient and easy-to-setup environment for anyone. However, Blancco is a relatively big company with its own dedicated team of IT professionals so it is also smart to research whether with our own resources it would be worth running this service locally (Richardet, n.d.)

An on-premise server means that the equipment and data, are bought and handled by Blancco itself and hosted locally. There are many benefits to this solution as well, such as security and reliability being always in Blancco's control, so with the right solutions it brings peace-of-mind knowing exactly the workings of the server. If the service was hosted by an external party and there were some issues, these could only be fixed through a support channel, and at a time of an emergency the fixes would perhaps be slower compared to having your own team ready for any malfunctions. If the server is on-premise and Blancco has their IT technicians, any failure within the service could be looked at immediately. This however come at the cost of convenience and price, Blancco will have to buy and own the server to host this service and the data, which is a big one-time investment but will be usable for a long time after the initial purchases. Maintenance costs aren't that high as there already is a server room with the required monitoring to make sure the server is working at an optimal rate. Scalability is not an issue but it is always a bigger investment (ibid.).

For the project of this thesis, a Cloud-based service was selected to be hosted by an external party to be determined. The next subchapters will research the possible products and services that could be used.

3.3 Product comparisons

With the requirements of all the departments at Blancco in mind, a feature matrix was created. First four products for comparison were selected from industry leaders, Files.com, OwnCloud, FileCloud and Egnyte. Through the white-papers and the companies web sites, all the necessary features were deduced and added to the below chart.

Feature Matrix	Files.com	Owncloud	FileCloud	Egnyte
Features				
Time-based links	☑	☐	☑	☑
Password-protected link	☑	☑	☐	☑
Data expiration	☑	☑	☑	☑
File retention policies	☑	☑	☑	☑
Guest log-in	☐	☑	☐	☑
Data Encryption	☑	☑	☑	☑
Archiving	☐	☑	☑	☑
API	☑	☑	☑	☑
Logging	☑	☑	☑	☑
Shared/Bot users	☑	☐	☐	☐
Desktop app	☑	☑	☐	☑
Browser access	☑	☑	☑	☑
Mobile app	☑	☑	☑	☑
Image/video preview	☑	☐	☑	☑
Multiple geolocations	☑	☐	☑	☐
Salesforce Intergration	☐	☐	☑	☑

Figure 5. Feature matrix

Additionally, through the same research the security features could also be taken into account and highlighted in the below chart.

Security Matrix	Files.com	Owncloud	FileCloud	Egnyte
Transit protocol	SSL/TLS	TLS	SSL/TLS	SSL
Data Encryption	AES256	???	AES256	AES256
Two-factor authentication	☑	☑	☑	☑
Built-in auditing	☐	☑	☐	☐
SSO on AzureAD	☑	☐ ?	☑	☑
Others:	Session expiration			N+1 redundancy
	Ip address pinning			
	Brute force protection			
	IP whitelisting			
Compliancies:	GDPR	GDPR	ITAR	ISO 27001
	HIPAA	LGPD	HIPAA	ISO/IEC 27018:2019
	ISO 27001	CCF	GDPR	SOC 2
		CCPA		
		HIPAA		

Figure 6. Security matrix

As the documentation is not perfect, some things could not be taken into account and perhaps led to some disqualifications. Out of these four products, Egnyte and Files.com were taken on for a more detailed comparison and demo.

3.3.1 Demo of Egnyte

Egnyte offers a 14-day trial for their software, in which you can switch between all four business plans offered. On the first look at the website you can tell it is meant for more collaborative and internal applications, much like a Microsoft Sharepoint or OneDrive which is quite familiar for the majority of users.

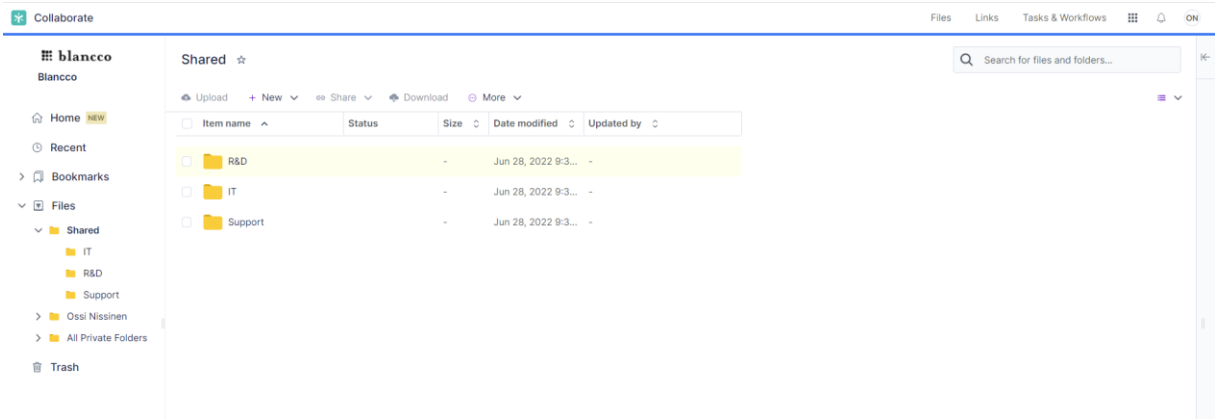

Figure 7. Egnyte user interface

The UI has some flaws, such as there not being and indication that whether the user is in an administrative or normal user mode. You can only tell when you go deeper into the settings and notice how much access you have to edit settings for the service.

While it is not very intuitive to navigate, Egnyte offers a far superior lifecycle management tool, once you get used to the interface, it is quite easy to use and doesn't require a lot of technical knowledge when implementing features. Using it feels a lot like a Microsoft SharePoint type of product, whereas it should be more production and software distribution related by its presented features. As seen on the product matrixes for these products, it is possible to bend this product to our needs eventhough at first sight it seems a to be designed for other uses.

3.3.2 Demo of Files.com

Files.com offers a 7-day trial of their 'Premier' subscription level, which is the most premium option. This includes all the features that the product has to offer.

Perhaps the leading factor for Files.com over Egnyte is the way the service is presented and designed, as it is obvious that most of the features of Egnyte are directed towards internal file-sharing and collaboration whilst Files.com offers many features for outside access, such as file drop-in box for non-users and static links for download files.

The interface of the service is very clean and intuitive to navigate, desktop application for this service is also a mount on File Explorer instead of an actual application, which means administrator access is done through the web browser.

Another clear benefit that was discovered during feature comparisons was the ability to designate the data location of a folder from the USA, Canada, the UK, Germany, Japan, Australia and Singapore. This is an additional benefit for Blancco's users that have strict data policies that their downloaded data shouldn't leave their continent or country (for example, federal customers).

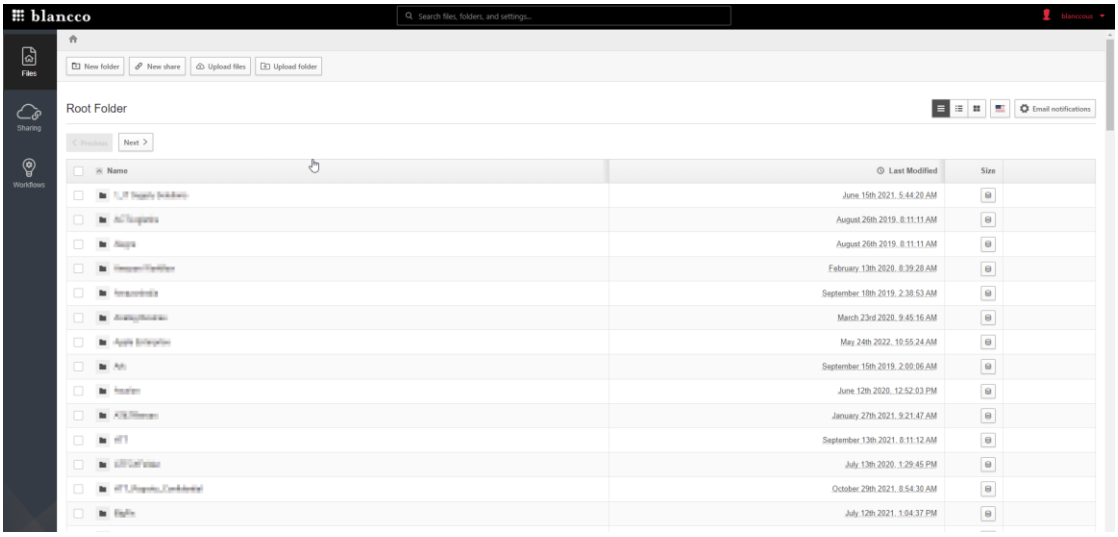

Figure 8. Files.com user interface

3.4 Feature comparisons

Through inspecting the detailed documentation for both of these products, all the features that are expected to be used could be parsed out. For the following subchapters every feature is presented how it operates on both of these services, as some features may be named similarly, they work differently. Files.com features are according to Files.com Features (2022) while Egnyte's features were dictated from 10 Unique Egnyte Features (2022) and their respective websites (Files.com and Egnyte.com).

3.4.1 Time-Based links

Time-based links cover any links directed at files or folders that have an expiration date after which they are no longer valid.

Files.com: Every link generated on Files.com can have an expiration date after which it will no longer be valid, by default the expiration of links is based on a global setting but can be adjusted for each link.

Egnyte: Every link generated on Egnyte can have an expiration date after which it will no longer be valid. Each link's expiration date has to be set manually when created.

3.4.2 Password-protected links

Password-protected links mean any links that require a password to access the contents (file or folder) behind the link.

Files.com: Links can have a password protection enabled when being generated, password is decided by whoever creates the link.

Egnyte: Links can have a password protection enabled, works similarly to Files.com

3.4.3 Static URL for files/folders

Static URL for file and folder paths mean that the same link can be used even if the file it directs to has been changed. This allows for new versions of software being uploaded to the service but the links staying the same so they don’t need to be updated.

Files.com: Files offers a great solution for links where you can change the path the link directs to, or even change the file which it directs to (to a later version) allowing for version control and unchanging links.

Egnyte: Egnyte links URL will stay the same if the file is replaced with another file of the same name and filetype.

3.4.4 File retention policies (Folder/Data expiration)

File retention policies are global or folder-specific policies that automate the deletion or archiving of unused and outdated files from the service to free up space.

Files.com: Offers a ‘File Expiration’ setting that will delete files after a certain amount of time, this can be specified per folder. Setting only affects files, not folders. Currently there is no way to move or archive files after hitting these expiration dates.

Egnyte: Offers a very well done ‘Content Lifecycle Policy’ feature, allows for moving files to ‘Trash’, move them to archive domain (another service) and deletion. This is basically file retention policy with an automated archiving which isn’t at the moment offered by Files.com.

3.4.5 API/SDK

API and SDKs can be used for Blancco’s product integrations, as at the moment majority of them work through direct download links. Any data that our products need from the service could be pulled with an SDK if there is a compatible language kit or directly with an API.

Files.com: Files.com has extensive API control and many supported SDKs, such as Java, JavaScript, Ruby, PHP, .NET, Golang and CLI. These allow for nearly full control over files and users. Users can generate API keys that will have the same access as the user, which can then be used in these API calls.

Egnyte: Egnyte does not seem to have any direct SDK support but does have as extensive API control as Files.com where all actions could be run with API.

3.4.6 Folder-based geolocations

Folder-based geolocations is the ability to assign folders to a server in a different geolocation, ideally this could be implemented on folder-level to allow for example Americas and EMEA folders for customers in those areas.

Files.com: Files offers 7 geolocations on their most premier plan, 2 on their middle-plan and 1 in their cheapest option. Locations include USA, Canada, the UK, Germany, Japan, Australia and Singapore. Two locations on the middle-plan can be chosen out of all the options but only two may be used. Data can also be migrated from one server to another if they need to be changed.

Egnyte: Egnyte does not offer multiple geolocations and in their documentation it is a bit unclear where the data is located.

3.4.7 Custom branding

Custom branding covers all the options that can be customized to fit the Blancco ‘look’.

Files.com: Customizations include interface colors, custom logo and icons, customized e-mail notifications, per-folder logos, header and footer text, login page help text, custom SMTP e-mail.

Egnyte: Customizations include file server label, logo and theme color, custom URLs, personalized emails and integration of Egnyte login with company’s website.

3.4.8 Bot users

Bot users are mostly users that aren’t controlled by a person, and are rather just the embodiments of automated processes such as product integrations which would use these users to access API control.

Files.com: Has bot users, which are prevented from changing their own settings and down have 2FA requirements. These count towards the user amount on the Files.com plan much like regular users.

Egnyte: No bot users.

3.4.9 Preview image/video/pdf

Previewing images, videos and PDFs allow for users to watch videos in the browser window without downloading the actual file

Files.com: Allows for previews for users and through a link without downloading.

Egnyte: Allows for previews for users and through a link without downloading.

3.4.10 Built-in archiving

Archiving would be the solution of moving outdated files to another service or server, such as the local NAS at Joensuu office for example.

Files.com: doesn't offer an archiving solution at the moment, could perhaps be done through API

Egnyte: Offers automated archiving as part of the 'Content Lifecycle Policy' feature much like in file expiration.

3.4.11 Public inbox for customers

Public inbox is a feature where external users can have a folder where they can drop files for us without the need of creating a user.
Files.com: Has a designated inbox feature, allows for an admin to create a folder which will serve as an inbox. The inbox can be secured with requiring registration (providing contact information) or requiring a password to access.

Egnyte: Possible to allow access to a folder through a link but then the user will see the contents of the folder and requires an account to access. Does not work for our use-case of receiving customer files for support for example.

3.4.12 Office product integration

Office integration generally entails that you can use Office 365 products, such as Word or Powerpoint, directly in the browser to edit documents. This in use works very similarly to the web editor on Sharepoint.

Files.com: Has a feature for editing documents, can also be disabled.

Egnyte: Has a feature for editing, with an Office 365 plugin for directly sending files to Egnyte platform from Word, Excel etc.

3.4.13 Salesforce integration

This integration allows for the uploading of files through the Salesforce portal for agents.

Files.com: No integration for SalesForce.

Egnyte: Possible to integrate with SalesForce.

3.4.14 Watermarking

Watermarking files with Blancco markers to ensure ownership of the copyright of the file.

Files.com: Can be automatically done only to PDF files, for only previews or for every file created. Other supported filetypes are PNG, GIF, JPG and BMP but these must be manually watermarked.

Egnyte: Watermarking files is only for previewing documents.

3.4.15 Workflows

Workflows for file-sharing services mostly entail the possibility of having an orchestrated path for a file, such as a PDF document going through the chain of command for each person to proofread and approve.

Files.com: Does not have workflows.

Egnyte: Called ‘Review and Approval Workflows’. Can create a flow in which a document goes through an automated path between different users, allowing each to review, approve or do some other pre-defined task with the document.

3.4.16 File collaboration tools

Like Sharepoint tools, collaboration tools are for multiple people to collaborate on a single document in different ways.

Files.com: Does not have this feature.

Egnyte: Has the possibility to create discussions on specific files, mention other people and request file edits from them, and share access to files that other users may not have.

3.5 Security comparisons

Between the two candidates, security is quite similar but still has to be researched from the standpoint of Blancco's IT team.

Table 1. Security comparisons

	Files.com	**Egnyte**
Transit Protocol	SSL	SSL
Data Encryption	256-bit AES	256-bit AES
Webhooks	✓	✓
Custom SSL certificate	✓	✓
2-Factor Authentication	✓	✓
Single Sign-on	✓	✓
File logging	✓	✓
User logging	✓	✓
ISO 27001 compliant	'Coming soon'	✓
SOC 2 compliant	✓	✓
Block countries	✓	✗

The protocols used in both of these are the same, SSL for transit and 256-bit AES for encryption on location. These seem to be the industry standards in this field. The only real difference between the two is that Files.com is not considered ISO 27001 compliant as of 2022, but they have claims of pursuing this certification for their systems as well. SOC 2 compliancy is provided on both.

3.6 Support comparisons

Support is an essential part of the service to be purchased, considering that all the software distribution and internal product integrations are taking place on the service. This means that if there's any downtime, it will have a heavy impact on Blancco's production and customer experiences globally, so quick actions are needed. The technical knowledge on how to use these services at Blancco is advanced, making basic support less needed but still appreciated if there are any concerns.

3.6.1 Files.com Support

Files.com offers run-of-the-mill support for the first 2 of its tiers, with limited availability and no guaranteed response times. This adds value to the highest Premier tier with the great benefits of priority, emergency lines, SLA with a refund if its not hit.

Table 2. Files.com support

Plans	**Channels**	**SLA**	**Emergency line**	**Availability**
Starter	Email/chat/phone	✗	✗	9:00AM – 7:00PM
Power	Email/chat/phone	✗	✗	9:00AM – 7:00PM
Premier	Email/chat/phone (with priority)	✓, with cash refund on missed SLA	✓, 24/7 access	9:00AM – 7:00PM

*US time

Big downside is however the supports location is in the US, so the time-zones are not suitable for EMEA where most of the operations are based. However, with an emergency line and the extended business hours, it would be assumed that a response could come within one business day.

3.6.2 Egnyte Support

Egnyte offers three different tiers to support their product, lowest being Standard, middle tier is Premium and the highest paid tier is Platinum.

Table 3. Egnyte support

Plans	Channels	SLA	Emergency line	Availability
Standard	Email/web/phone	✗	✗	24/7
Premium	Email/web/phone (elevated priority)	✓, 1hr	✗	24/7
Platinum	Email/web/phone (highest priority)	✓, 30 minutes	✗	24/7

Egnyte has great support from the standard plan, as the availability is always 24/7 and it increases only with priority and a more aggressive SLA goal. Additionally with the SLAs, there is a targeted fix/workaround found within 24hrs for the Premium tier and 12hrs for the Platinum tier.

4 TECHNICAL PLAN

As this thesis won't cover the selection or implementation of the service, some general plans and ideas are covered that should be used when this service is actually implemented. Since there is no service to base these ideas on, it will be handled on quite a general level to cover each step with the framework of how it should be performed by the project team.

4.1 Groups and users

For user permissions, I have collected the permissions from both contenders, Files.com and Egnyte, and categorized them to some basic permissions categories so it would be easiest to see what access each user has.

Readonly, Able to list and download files and folders

Writeonly, able to upload files and create folders

Readwrite, both **Readonly** and **Writeonly** access

List, Able to list files and folders, but not download them

Bundle, able to share files and folders with share links

History, able to view history of files and folders

User administration, able to edit other groups and users permissions

Table 4. Group permissions

Group	Readonly	Writeonly	readwrite	List	Bundle	History	User admin-istration
Admin	✗	✗	✓	✓	✓	✓	✓
Auditor	✓	✗	✗	✓	✗	✓	✗
Employee	✗	✗	✓	✓	✓	✗	✗
Customer	✓	✗	✗	✗	✗	✗	✗

Admin users would contain just the selected few who will oversee and monitor the platform, so Blancco's IT department. This requires full access to all parts of the service and the ability to assign and remove permissions from coming and going customers. Admins also have full access to every folder.

Auditors would be both internal and external. There would most likely be one account so that any auditor that would like to see into the platform has visual access but can't actually download or share anything. They would be able to see the log history for auditing purposes. Auditors will have access to every folder.

Employees require 'normal' access, so that they can save and download data and share links with co-workers/external parties. Employees will have access to the folder related to their department.

External customers should be limited the most, their permissions should only cover the folder that they are allowed in, and no public sharing of the files in

there or viewing any history of the folder. They can't create new files by default but if they need to drop anything in their folder perhaps this permission can be altered case-by-case. Customer will only have access to their own customer folder.

4.2 Folder structure

In this part of the project, there are really 3 ways of doing the new folder structure. First, is to keep the old file structure for simplicity's sake.

Second, is to assign folders based on area so that Americas has their own folder structure, EMEA has their own and APAC. Downside to this is amount of storage that will be used will increase, as all of these areas will include some of the same data but for users it will show as faster download speeds and content that is held within your own area as is important to some federal customers. EMEA folder however should keep the OTA files as and product integrations files as it would require more advanced technical execution for software side to choose between the three areas, it will be easier to just collect from EMEAs subfolder.

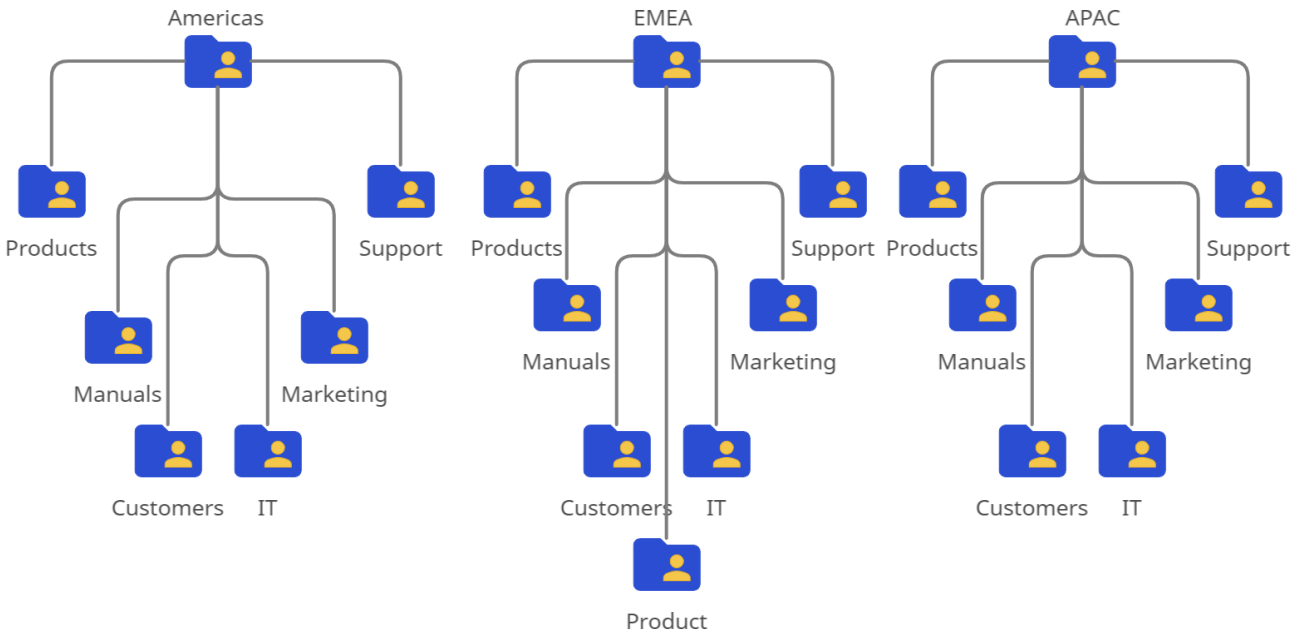

Figure 9. Geo-location based folder structure

Last, is to split the folders by teams and create a separate 'Customer' folder, where each customer has been assigned to a server in their own area. This

would been customer data is kept near the customer, but all the important data is located in EMEA. This will result in slower download times for users far away.

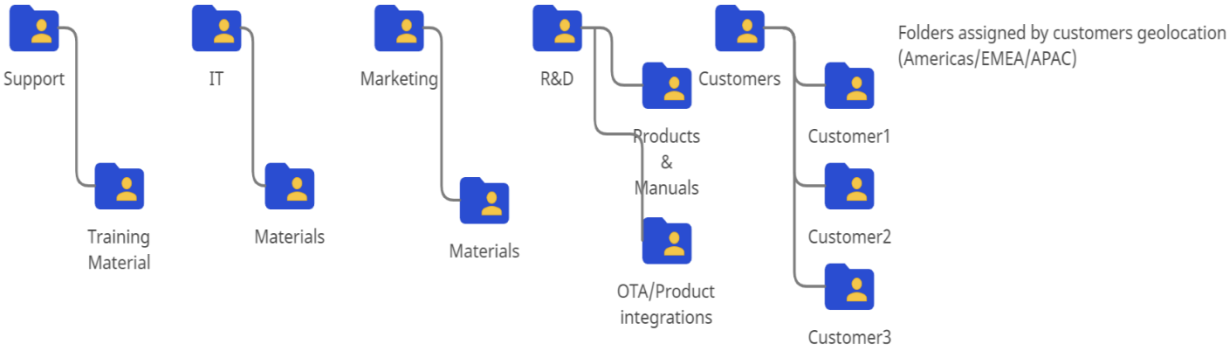

Figure 10. Department-based folder structure

4.3 Archiving

How archiving is handled will very much be defined by the product in use. Some Blancco material will stay indefinitely but things related to products and their manuals should follow the Blancco lifecycle policy. After support has ended, it would be the best to archive these somewhere else where data storing prices are more moderate, such as a network drive at one of the offices. Egnyte has great archiving settings and this could be handled so these files get automatically archived but when it comes to Files.com the only possibility for any ‘life-cycle’ for expired files will delete them completely off the server, which is why archiving would be a manual process. This would be up to product and support teams to manually make sure old product versions are archived when new ones are updated to product folders. Blancco has guidelines for proper life-cycle policy and this should be followed.

Customer folders can follow expiration dates based on customer’s contracts. As their contract with Blancco expires, the data should be removed from the service, because there’s no need to archive outdated material as new ones will be provided if a new contract is made.

4.4 Product integrations

All of Blancco's external products require some kind of integrations, along with our internal ones. These include the product delivery tools, KPI scripts, recruitment tasks, product updates and firmware downloads. All of these are at the moment handled by hard-coded paths in software or via API. However, as the integrations mostly mean that our other products should be able to download data from the server, very complicated API is not required, just the ability to pull a file from a specific path with a specific filename and so these folders must be created and the files should be handled by the product teams.

No matter the file structure, as product integration files should perhaps be in the same folder, with user/users that have API access allowed to modify the contents. With the great API/SDK control on both products, development teams would only need this account and the proper manuals to adjust our products and internal software to direct to this new server and folder instead of the old one, as most of the basic groundwork for how these integrations work is already done.

5 IMPLEMENTATION PLAN

As selecting the service to be used isn't within the scope of this thesis, only the generalities of the implementation plan are covered with some highlighted steps for Blancco's project team to use as a framework for the project.

5.1 Timeline

Timeline wise, the creation of this thesis covers around 50% of the complete work, meaning the planning phase is done and only the implementation is left. The first half of the project included finding out the company needs and requirements, comparing all products and choosing the best option for Blancco.

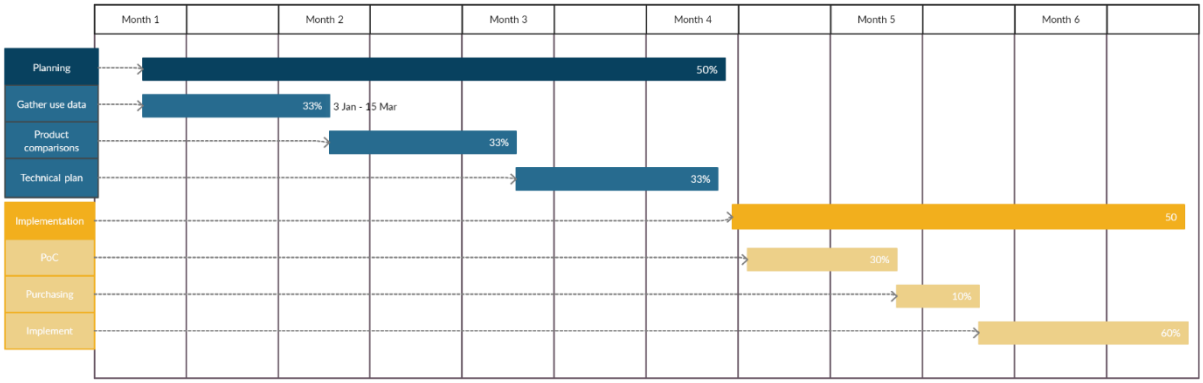

Figure 11. Project timeline

Second half of the project is much more hands on, first step would be to run a proof of concept demonstration to more accurately create an environment such as Blancco would have in production and try all the features required. After that a purchasing decision is made and then finally, implementation done by the author of this thesis with the IT team.

5.1.1 Proof of concept

As both of these services, Egnyte and Files.com have been demonstrated based on the free trials provided by them, we used the generic tools and features they were offering. Creating a proof of concept is a bit more advanced version of this where we get to use the service with the features we were the most interested in. This will allow the testing of the following:

- Product integrations
- Data monitoring
- Access logs
- Training
- Folder structure
- Group/user hierarchy
- Data geolocations
- ‘Real use’ testing

As most of these have been researched already, the biggest obstacle will be product integrations. The teams that require the API and SDK control over the solution should be on board to create us test versions of the software that should be integrated into it. Otherwise, the PoC can be a good chance to take the necessary steps to create the environment that was documented in the technical plan and see how it operates in a more realistic scenario.

5.1.2 Selecting a provider, plan and purchasing

As the comparisons have been made, the service should be made dictated by the best cost and compatibility with our use-cases. This came down to Egnyte and Files.com in the comparisons but after selecting the preferred service, also a data plan and support plan for both are to be selected.

In Egnyte's case, the subscription on list prices is always annual but Files.com offered discounted prices for 3 year contracts so those need to be referred as well. After negotiations and signing a contract, we should have a service with an optimal amount of users, data and a support plan.

Trainings

5.2 Implementation

The implementation phase will include heavy involvement from members to be decided from the IT team and the author of this thesis. Complete implementation requires the following steps to be completed;

Table 5. Team responsibility table

Objective	Responsibility
Create folder structure	IT
Purchasing	IT
Integrate with Active Directory	IT
Configure SSO	IT
Configure user/group permissions	Each team plans their own, IT configures
Configure policies	IT
Create Customer inbox	IT/Support
Migrate data from old FTP	IT
Create Blancco branding	IT/Marketing
Configure product integrations	IT/R&D
Manage archiving	IT

Blancco personnel that will perform these tasks is to be determined, as these issues are subject to change in case there are personnel changes between the creation of the plan and the actual execution.

6 CONCLUSION

The implementation plan is a critical part of the project for creating a new file sharing system for Blancco. It provides a roadmap for the project and outlines the tasks that need to be completed in order to successfully deploy the software. Without a well-thought-out implementation plan, it is very difficult to ensure that a project will be completed on time and within budget.

For this project, this thesis provides sufficient information required to select the best service for Blancco and outlines the features we deemed important for it.

In the future, as this project is completed it should be sufficient for use for many years, as we opted out for a Cloud-based service we have the flexibility to keep adjusting the service to suit our requirements and most of the security and back-end is handled by a 3rd party it will require fairly minimal resources from Blancco. IT will administrate the use of the service and users will follow proper etiquette in their use as well to mitigate any security risks.

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Modern File Share -project survey

The old File Transfer services Blancco is using are going to be replaced with a single modern solution that will fit the current security standards and will be a more efficient service in general. This questionnaire is meant to scope out the current uses of the FTP-services of different teams.

1. Which team are you representing for this questionnaire? *

Valitse vastauksesi

2. Does your team have a File Transfer -service in use? *
(download.blancco.com, Files.com, something else...)

- ◯ Yes
- ◯ No

3. What File Transfer -services are in use for your team? *

- ☐ download.blancco.com
- ☐ Files.com
- ☐ Muu

4. What use-cases does your team have for these services? *
Customer uses, product integrations, internal file sharing etc.?

Kirjoita vastaus

5. What requirements do you have for the new service to serve these use-cases?

- ☐ Time-based access
- ☐ Data/folder access expiration
- ☐ Time-based data removal
- ☐ Guest log-ins
- ☐ Individual log-ins for Blancco employees
- ☐ Data encryption
- ☐ Archiving

6. Are there any additional features you need or want that weren't mentioned in the previous question?

Kirjoita vastaus

7. Does your team have any product integrations with the File Transfer -service? *

- ◯ Yes
- ◯ No