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Abstract

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Keywords: Keyword1, Keyword2, Keyword3, Keyword4, keyword5.

Commented [CS1]: Reviewing for Conf-IRM is blinded. For the review process, the first page should include the title, abstract, and keywords ONLY, but not the authors names or affiliations. These can be replaced with Author1, Author2 etc. Names should be added in the final camera-ready version for publication.

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Abstract title (Heading 1):14pt Times New Roman, bold, left justify.

Abstract body: 12pt Times New Roman, *italics*, no longer than 200 words; full justification (as shown here)

Leave one 12pt line space between abstract and keywords

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Title: (Style: Title) 16pt, Times New Roman, bold, centered; leave two 16pt line spaces after the title

1. Introduction

Commented [AM5]:
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Paragraph Text: 12pt New Times Roman. Full justification (as shown here); no indent or extra spacing between heading and paragraph text.

Always leave one line spacing (12pt) between paragraphs and sections; no indent

Data transfers constitute one of the most performed tasks in the Internet today. Users publishing files to a website, moving files that are too large for an email application, transferring files securely between different computers, uploading photos to services such as Flickr (www.flickr.com) or backing up a to a remote server are all engaged in data transfer operations. File Transfer Protocol (FTP), for example, is still used to perform bulk data transfers across networks (Grzywa et al., 2001). It is important to note that this simple-sounding task (data transfer) is essential for the interoperation of networked computers, especially when the different computing environments of modern heterogeneous networks are considered.

Potential user devices in the network range from Personal Digital Assistants (PDAs) and mobile phones to specialized servers and large-scale corporate systems. All these devices could operate using different word formats; they might store the data in different forms and forward packets in non-compatible ways (big-endian vs. little-endian computers) (Tanenbaum, 2003).

2. Overview of Data Transfer Mechanisms

There are two main approaches to perform data transfers in today's IP-based networks. One is based on FTP and several variations to that protocol and the second, and much newer, approach is based on peer-to-peer networking configurations. Let's review both.

2.1 FTP Overview

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Essentially, FTP is a client-server protocol that facilitates the transfer of files between two computers connected via a network, such as the Internet (Brown & Jaatun, 1992). The protocol has several fundamental components that perform the required functions for establishing the sessions between systems, and coordinates the transfer of the files. These components are as follows:

- Server-FTP that consists of the Server Protocol Interpreter and the Server Data Transfer Process;
- Server-side File System;
- User-FTP that consists of:
  - the User Interface,
  - User Protocol Interpreter, and
  - the User Data Transfer Process;
- User-side File System;
- A User; and
- A communication channel for the control and data connections.

Commented [AM7]: Bullet points should be formatted as shown here; left justify; do not leave spaces between lines.

Second-level bullets illustrated here

Commented [AM8]: Leave one line (12pt) after the last bullet point text.

An alternative configuration of FTP provides for the transfer between two servers through a third system that provides the control function between the servers. In both configurations, FTP requires that the control channel be open during the data transfer process (Postel & Reynolds, 1985).

The FTP architecture is displayed below (see Figure 1):

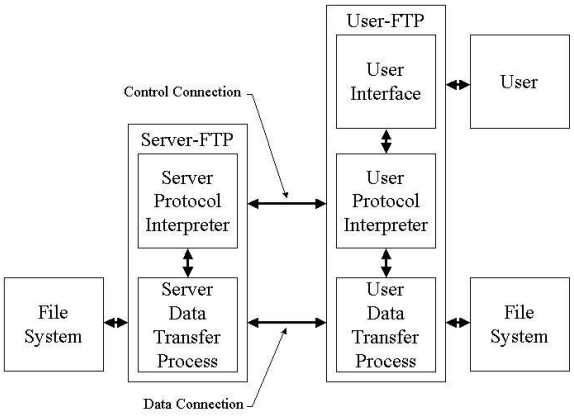


Figure 1: FTP Architecture
(Source: Postel & Reynolds, 1985)

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Figures: All figures must be centered and have a title and a number (e.g. Figure 1). Do not abbreviate 'Figure'). Place title below the Figure, 12pt Times New Roman, centered (as shown here)

No restriction on font type or size used within the figures; use color as needed.

Group all parts of your figure.

Leave one line spacing between the figure and figure title, and leave one line spacing before and two lines spacing (12pt) after each figure

2.1.1 Telnet Authentication and Encryption

As previously discussed, FTP utilizes the control connection to coordinate the data connection and execute commands on the File Systems of both the user and the server. FTP utilizes the Telnet protocol to execute the commands (Postel & Reynolds, 1985). This fundamental design lends itself to security breaches that may permit eavesdropping of user ID's, passwords, file names, and other information passed through the control channel. It also may allow an active attacker to change settings and execute commands on the file system (Brown & Jaatun, 1992). This fundamental security flaw was initially addressed when Borman (1993) proposed the passing of authentication information, and a mechanism to enable encryption of the data after successful authentication for the Telnet protocol. The result was that user passwords would not be sent in clear text, and the data stream would be encrypted utilizing any general authentication and encryption system. However, it should be noted that the "Telnet authentication and encryption option does not provide for integrity protection only (without confidentiality) and does not address the protection of the data channel" (Horowitz & Lunt, 1997).

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Do not use fourth-level titles

Scenarios				
Send Request Response	Request Hash	Storage Hash	Generated Hash	Action Required / Notification Returned
	h_1	h_1	h_1	Validated file, integrity confirmed, send file
	h_1	h_1	h_2	File has changed since original message, original hash may not have been updated, confirm file integrity before continuing, regenerate hash and reconfirm
	h_1	h_2	h_2	Message to Recipient is invalid or out of date, may be invalid request, request retransmission of message
	h_1	h_2	h_1	Original hash may be corrupted, update hash file, confirm before transmitting file
	h_2	h_1	h_1	Message to Recipient is invalid or out of date, issue new notification, request retransmission of message
	h_2	h_2	h_1	File has changed since original message, original hash may not have been updated, confirm file integrity before continuing, regenerate hash and reconfirm
	h_2	h_1	h_2	Original hash may be corrupted, update hash, confirm before transmitting file

Table 1: Send Request Response

5. Conclusion

A basic requirement by users is that files be transferred efficiently and without modification. File integrity, therefore, becomes a critical element in the sharing of files. During the transfer of a file, a self-correcting system would permit the user to acquire a file while the error controls would operate transparently in the background. An added feature of the Hash Triplet is that it provides the system with specific points of origins for the root error causes and allows system designers to promote a wider range of remedies.

5.1 Formatting References

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Journal Article. The format is: Single Space, Hanging 5mm: Author(s) (date). "Title." *Journal Name in Italics*, *Volume in italics*(Issue), pages

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The references should look like the samples below.

References

Burgess, M. (2019, January 21). *What is GDPR? The Summary Guide to GDPR Compliance in the UK*. Retrieved 26 January 2018, from https://www.wired.co.uk/article/what-is-gdpr-uk-eu-legislation-compliance-summary-fines-2018

Coleman, D. and R. Kanna (eds.) (1995). *Groupware Technology and Applications*, Upper Saddle River, NJ: Prentice Hall PTR.

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Tables: All tables must be centered and have a title and a number (e.g. Table 1). Do not abbreviate 'Table'). Place title below the Table, 12pt Times New Roman, centered (format as shown here)

No restriction on font type or size used in tables; use color as needed. Left justify 'text-based' content in table. (See example here)

Include all the tables as MS-Word tables, not as jpeg or similar format

Leave one line spacing between the table and table title, and leave one line spacing before and two lines spacing (12pt) after each table

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Figures & Tables - Further comments:

All tables and figures must be referenced in the text by statements like: "Details are presented in Table 1". Do not use "as in table below".

Avoid splitting tables or figures across pages, e.g. place table/figure at the top of the next page after you refer to it in the text.

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Format of reference in the text as (Sundt, 2006) or Ahmad (2013) or (Wei & Zhu, 2013) or (Wei et al., 2014)

List references in alphabetical order at the end of your text. Note the format of the entries as shown here. Use 12pt Times New Roman, left justify, single-spaced, Hanging Indent = 5mm. Example of entries shown here

In the case of more complicated reference sources, refer to APA or use common sense

McNurlin, B. and R. Sprague (1998). *Information Systems Management in Practice*, *6th edition*, Upper Saddle River, NJ: Prentice Hall, 133-170.
Nunamaker, J. F., R. O. Briggs, and D. D. Mittleman (1995). "Electronic Meeting Systems: Ten Years of Lessons Learned." In Coleman, D. and R. Kanna (eds.) *Groupware Technology and Application*s, Upper Saddle River, NJ: Prentice Hall PTR, 146-193.
Singh, S. and I. Chana (2016). "A Survey on Resource Scheduling in Cloud Computing: Issues and Challenges." *Journal of Grid Computing*, *14*(2), 217-264.
Sundt, C. (2006). Information Security and the Law. *Information Security Technical Report,* 11 (1), 2-9.
Svantesson, D. and R. Clarke (2010). "Privacy and Consumer Risks in Cloud Computing." *Computer Law and Security Review, 26*(4), 391-397.
Wei, L., H. Zhu, Z. Cao, X. Dong, W. Jia, Y. Chen, and A. V. Vasilakos (2014). "Security and Privacy for Storage and Computation in Cloud Computing." *Information Sciences, 258*, 371-386.

Appendix 1

Commented [AM14]: Place appendices AFTER the References

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• Follow the format and numbering of paper content exactly as described and shown in the paper guide.
• Include all the tables as MS-Word tables, not as in jpeg or similar format.

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Avoid footnotes; use endnotes only

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