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Look at a Few Time Stepping Frameworks and Break Down their Benefits and Weaknesses.

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Abstract: -The expression time stamp is acquired from the mail center term elastic stamp. It is utilized to tell when a specific event or occasion happens. It gives precise data about the planning of the episode. It can give exact information about each moment, even seconds, of the occurrence that happened. It is a progression of letters or data in encoded structure that gives data on the event of an occasion. It very well may be the hour of an ongoing event or the hour of an occasion that happened previously. In the present computerized age, a period stamp alludes to the advanced date and time that is related with the advanced report..

Introduction: -
A lot of data and information is saved in an organisation on a daily basis. For storing these data and information in proper format many varieties of databases are used. These databases use many techniques like data warehouse, data mining etc to properly arrange and organise the data which can be used for many purposes for the growth of the business. In some scenarios, it gets important to know the time at which the data was organised. If someone wants to refer to some data which was stored on a particular day then it is very important that the data also mentions the time on which it was created. Also, it is important to have the time linked to the data to check when was the last time it was updated or modified. Hence, time stamping is the process of showing the time, day and date at which a particular event has taken place. This event could be either related to file creation, clicking a picture etc. This was traditional time stamping, but as everything is digitised these days, so digital time stamping was discovered. The data representation is done in consistent format which allows to compare two different records and helps to track the progress over the period of time. The process which involves assigning time stamps to the events is called time stamping. Its goal is to assign time to each event or sequence of events which takes place. Each file in computer system has basically three timestamp components which are: -

- The last time when the file was assessed.
- The time on which the file was modified.
- The time on which the status of the file was changed.

A few document archivers and some form control programming, when they duplicate a record from a distant PC to the neighbourhood PC, change the timestamps of the nearby document to show the date/time in the past when that record was made or altered on that far off PC, as opposed to the date/time when that record was replicated to the neighbourhood PC.

Types of time stamping: -

Following are different types of time stamping which is used to assign time to each and every event that occurs based upon the type of the event: -
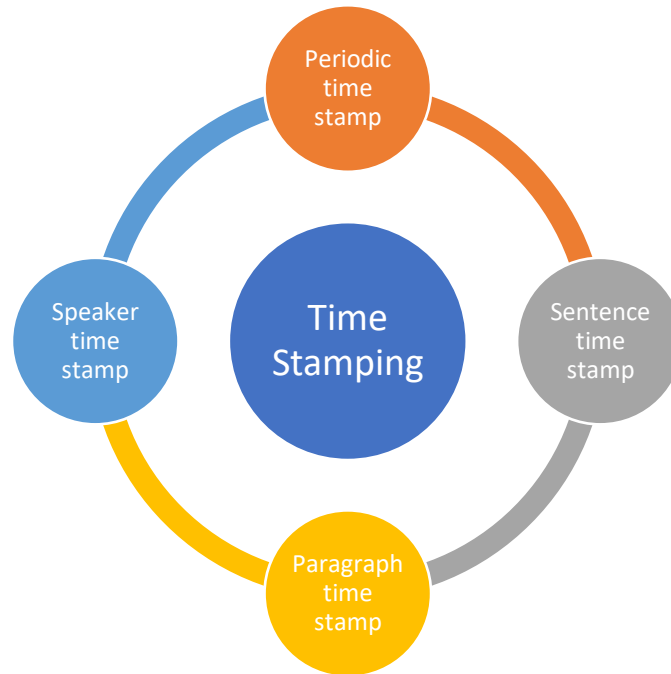
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Figure 1. Types of time stamping.

1. Periodic time stamp: -
- As the name suggests these time stamps are used to assign time stamps to the event which occurs at finite periods. For example, an event which occurs every 20 seconds.
- They will exist next to the word which is spoken after same period of time frame.
- It is commonly used where timestamp are not so frequent and also in case of footage videos.

2. Sentence time frame: -
- These are the time stamps which occurs at the start of each sentence which means a time stamp is assigned whenever a new sentence begins.
- They are considered to be factor to distract the users but it also provides high resolution whenever location of the audio is to be refered to.

3. Paragraph time stamp: -
- It can be understood from the name itself that this time stamp is assigned at the start or end of each paragraph.
- These are less frequent as compared to the other time stamps but they are also less obstructive when they are placed at the end of the paragraph.
- They have less frequency of occurrence but still they are useful for the users to locate a particular audio transcript in the paragraph.

4. Speaker time stamp: -
- These are placed whenever there is change in the speaker. These are used in areas like conducting interviews, depositions, panel discussions, etc.
- They are useful to find answers to specific questions, or responses.

Objective and characteristics of Time stamp: - [2]
Following points explains the characteristics and goal and objective of time stamping of an event: -

Objective of Time stamping: -
- The purpose of time stamping is to locate and give information about the occurrence of the event which explains when that particular event took place.
- It gives information about the date, day and time of the occurrence of the event.

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- It also helps to make ensure the authenticity of the document and helps to verify the existence of the document.
- For-signature or digital time stamping it helps to know the validity of the author as well as the validity of the document.

Characteristics of Time stamping: -
- Independent: -
Time stamping shows the time at which the particular incident or event took place. It does not matter on which server it took place. Basically, time stamping is independent of all such factors. It will only represent the time at which incident took place.

- Easily managed: -
It is very easy to manage time stamped document rather in an organised manner which shows the time of creation of the document. It also does not occupy more storage area and can be easily managed in the user's computer system.

- Visibility: -
Time stamping is easily visible and is a transparent feature.

Anybody who is authorised user of the document can easily see the time stamping of the documents.

- Time duration: - Time stamping is not time bound this means when once time stamping is assigned to the document it will remain as it is with the document which means it will not change by itself and will remain intact for longer periods of time.

Time stamping techniques: - [3]
Time stamping technique is f following two main types: -

a. Basic time stamping ordering protocol.
b. Strict Time stamping protocol.

Figure 2. Time stamping techniques.

a. Basic Time stamping ordering protocol: -
- The objective of this is to order transactions which is related to their time stamps. In this technique, the schedule is equal to the serial order which is corresponding to the order of the transactions of the time stamps.

- There should be an algorithm which will make sure that there must not be violation of the order. To make sure that this is implemented two time stamp values will be used for database X.

- W_TS(X) will be the largest timestamp of transaction which was executed to perform write function in the database.

- R_TS(X) will be the largest timestamp of the transaction which is executed to perform read function from the database X.

- At the point when the Basic TO calculation recognizes two clashing tasks that happen in a wrong request, it dismisses the last option of the two activities by cutting short the Transaction that gave it. Plans created by Basic TO are destined to be struggle serializable. Currently examined that utilizing Timestamp can guarantee that our timetable will be sans halt.

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b. Strict Timestamp ordering: -

- The other modification of basic timestamp ordering is Strict timestamp ordering which will implement both strict and conflict serializable timestamp ordering.
- In this variety, a Transaction T that gives a R_item(X) or W_item(X) to
such an extent that TS(T) > W_TS(X) has its perused or compose activity deferred until the Transaction T' that composed the upsides of X has committed or cut off.

Advantages of Time stamping: -
Following are some advantages of time stamping: -
- Easy to manage: -
Documents containing time stamps are easy to manage and does not need any specific space for its storage. They can be stored in the system itself which is used by the user to storing his documents.

- Faster data view: -
Since time stamp shows the time on which the file was created or a particular incident took place, it makes it very easy for the user to locate a particular file which he is searching for. If they remember the time then they can use this time as a search key element to locate the file easily and quickly.

- Helps to organise the data and information: -
A lot of data and information is present in unstructured format. Time stamping helps the user to arrange the data in proper structured manner and have better well organised data.

- Transparent and visibility: -
The time stamp feature is transparent and anybody who is authorised user of the file or document can see the time stamp related to that particular file properly.

- Helps to take quick decisions: -
As time stamps shows the latest time at which the file was updated or modified, it is used to gather information quickly which is used for making quick decisions for the business.

Implementation process of time stamping: - [4]
Following are the points which explains the implementation process of the time stamping technique: -

- Time stamping uses Public key infrastructure which follows various steps to assign time stamp to the event.

- Once it is created then a hash value will be sent to the TSA by the client which is similar to the process of sending unique identifier.

- Now if there are any changes or modifications in the file, then everything will be sent to the server for updating.

- The person responsible for time stamp will integrate hash value with other important information like reference time. The output will then be signed by private key.

- After this a token which has the time stamp will be sent to the user.

- Now the client application will save this token which contains the important time stamping information.

- Whenever a file is accessed the client application will confirm its authorisation by comparing it with the TSA. If any deviation is noticed then alert message will be sent.

Conclusion: -Time stamp is the term which is gotten from the mail center term elastic stamp. It is utilized to illuminate when a specific occurrence or anything happens. It gives appropriate data about the hour of the specific occasion. It can give the specific subtleties of each and every moment, even seconds of the occasion at which it has occurred. It is a grouping of

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characters or data which is in encoded variant which gives data about the event of the occasion. It very well may be a period which is going on in the present or the hour of the occasion that has happened previously. In the present period of computerized world, time stamp alludes to the advanced date and time which is connected with the advanced information. Model could be PC documents which gives the insights concerning when the record was made, and when was the last time it was changed.

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