**Topic: Distributed Database System**

Om Prakash Dhakal Article Review 1(Distributed Database System and method)

Reference Information:Shostak, R. E., & Systems, P. (1997, February 07). Patent US5913029 - Distributed database system and method. Retrieved March 07, 2017, from <https://www.google.com/patents/US5913029>

Purpose of Study: To track session data item values for each client sessions, the shared data item values, and a system for transforming the session template to a particular client computer upon starting of a client session between said client computer and said server computer.

Sampling Comments:  Shostak(1997), “Each page may contain either shared data or session data, and the particular type of data depends on the type of page where the data is located”. In every site there includes shared data or session data and distributed data processing system, which shared data may be automatically updated because all of the shared data stored on the server and a copy of the shared data may be cached on each individual client computer but there is only one logical copy of the shared data.

Measures:  The system in accordance with the invention has a unified system in which both the data and application logic were stored on the server, the shared pages act as the back-end data depository, and the session pages are unique for each new session started by a client computer. Shostak also retrieved and any updates to any shared data items may be automatically propagated through the system to each client computer that is currently connected to the server.

Findings/Results/Main Points:Shostak’s research found that a complex client-server application to be generated in a simple manner using a single graphically oriented programming language. In particular, it may enable the generation of the complex client/server system, including data structures, application logic and user interface, using a series of graphical pages connected together by macros. Each page may represent a record that may have a plurality of different data items, and the macros may perform the calculations on the data. Also found a distributed data processing system and method in which the traditional server software application and the traditional client software application are unified into an application located on the server having a series of graphical pages. Each page may contain either shared data or session data, and the particular type of data depends on the type of page where the data is located.

Conclusion: A distributed data processing system and method are provided having a server computer and a plurality of client computers connected to said server computer, the interaction of each client computer with the server computer being a separate client session. A system for tracking the session data item values for each client session and the shared data item values, and a system for transferring the session template to a particular client computer upon starting of a client session between said client computer and said server computer.

Article Review 2(Distributed Database System)

Reference Information:Douros, B. P., Revilak, S. A., & Llc, A. I. (2016, July 05). Patent US20170011085 - Distributed database system. Retrieved March 07, 2017, from https://www.google.com/patents/US20170011085

Purpose of Study: To manage potentially concurrent transactions in distributed database system includes maintaining, at a first node, records of transactions executing on one or more nodes, each having a transaction state, execution of a first transaction at a second node including an operation for accessing a first data element stored on the second node and execution of a second transaction at the second node.

Sampling Comments:  Douros(2016),“ In general, a database transaction symbolizes a single unit of work (including one or more operations) performed by the database management system on the database. To ensure that database transactions are processed reliably, database transactions must be atomic (i.e., a transaction, including all of its one or more operations, must either complete in its entirety or have no effect whatsoever), consistent (i.e., a transaction must move the database from one valid state to another valid state), isolated (i.e., concurrently executing transactions result in the same state in the database as would result if the transactions were executed serially), and durable (i.e., a committed transaction will remain committed regardless of system crashes, errors, and other issues)..”

Measures: Database transaction that operated in the distributed database system 102 was associated with a time interval that represents a lifetime of a transaction. The transaction identifier is a globally distinct number that identifies the transaction in the distributed database system 102 and specifies a start time (i.e., the beginning of the time interval) for the transaction. The distributed database system described above can be implemented, for example, using a programmable computing system executing suitable software instructions or it can be implemented in suitable hardware such as a field-programmable gate array (FPGA) or in some hybrid form.

Findings/Results/Main Points: Douros’s research found that the list of transactions including the first transaction; determining that an outcome of the second transaction depends on an outcome of the first transaction based at least in part on the list of transactions; and suspending execution of the second transaction until after the first transaction is complete based on the determining. Also found a plurality of nodes arranged in a distributed database system, each node including at least one processor; and a communication medium connecting ports of the plurality of nodes for sending and receiving information between the plurality of nodes; wherein a first node of the plurality of nodes is configured to maintain records of a plurality of transactions.

Conclusion: In general, a method for managing database transactions in a distributed database system including a plurality of nodes includes: maintaining, at a first node of the plurality of nodes, a first plurality of records of transactions in the system, each record in the first plurality of records being associated with a transaction and including a start time of the transaction and a start time of an oldest transaction that was active at the start time of the transaction, one of the records in the first plurality of records being a record of an oldest currently active transaction in the system; maintaining, at a second node of the plurality of nodes, a second plurality of records of transactions, the second plurality of records including records of completed transactions associated with the second node, each record in the second plurality of records including a transaction start time and a transaction end time.

Article Review 3(Distributed database management System)

Reference Information:Beach, B., Platt, D. C., & Tivo, I. (1999, October 20). Patent US6728713 - Distributed database management system. Retrieved March 07, 2017, from https://www.google.com/patents/US6728713

Purpose of Study: To examine all objects in the database and depending on the object type, examines various attributes and attribute values to decide if the object should be retained in the database. Also to replicate data objects called “slices,” that are encrypted using short-lived symmetric key and broken into a succession of short, numbered data packets before being transmitted to client devices.

Sampling Comments: Beach(1999), “A slice may communicate service related data to a client device or contain an authorization object indicating the allowable time delay before another authorization object is received, as well as one or more symmetric keys used to decrypt new slices which are valid for a short time period.” When a new object is received, the database is checked to see if all dependencies of that object are present and, if so, then the new object is added to the database.

Measures: Program guide objects contained all information necessary for software running in the client system to tune, receive, record and view programs of interest to the user of the client system, selecting from among all available programs and channels as described by objects within the database.

Findings/Results/Main Points: Beach’s research found that the system creates a self-maintaining distributed database system that ensures that a consistent subset of a central database is replicated in any number of client devices. In addition, the invention provides a system that ensures that data transmissions between a server and client are secure. Data packets are captured by client devices and held in a staging area until all packets in the sequence are present. The packets are then reassembled into the correct slice, which is then decrypted. A data packet is discarded when an error is detected in the data packet. a reaper that periodically examines all objects in the database and, depending on the object type, examines various attributes and attribute values to decide if the object should be retained in the database.

Conclusion: In general, a distributed database management system that enables a client to easily maintain the data in its local database and to synchronize said database with the main server database. Data packets are captured by client devices and held in a staging area until all packets in the sequence are present. The packets are then reassembled into the correct slice, which is then decrypted. A data packet is discarded when an error is detected in the data packet. Database updates are treated as transactions such that an entire transaction is completed or none of the transaction is completed. Data packets which are older than a selected time period are purged from the staging area on a periodic basis.