

Z2 Computer Solutions

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The Snippet Engine Technology Worldwide Distributed Database Networks (WDDN)

Inventory and Order Fulfillment Solutions

Today almost all businesses rely on the Internet for their sales and customer support. Many also rely on the Internet for their internal communications, for example to maintain product inventory and order fulfillment with their warehouses and shipping centers. Further, they need their website shopping cart to reflect their product levels in real time, and to track the orders from payment to final delivery.

In simple terms, the complication is that the shopping cart has one computer database, while the Order Fulfillment Center has another database, while one or more external warehouses have their own databases, and those may interface with shipping agencies having still more databases. Each of these external databases require instantaneous data exchanges for real time synchronization.

At this time nearly all data exchanges between these scattered databases are accomplished by TCP/IP connections between server-applications. Each server-application is essentially a software program that queries and updates a single local database.

The problem is that the database being queried and updated by its server is also simultaneously being used for its normal operations. This results in two or more masters updating the same data, resulting in random data-conflicts.

Discovery Begins:

**By looking at the same thing as everyone else,
but seeing how to make it different.
So It Is With The Snippet Engine's
Innovative Software-Construct.**

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For example: the server to the shopping cart's database is updating a product's inventory based on a report from the warehouse that it found 50 items broken or missing. At the same time the shopping cart is also using the same database, and showing the product's quantity available to be 20 items, but, it is showing this value simultaneously to 20 online Browser-users. Each customer wants 20 items, and they all hit the order button at the exact same time.

The data conflict is not obvious, but can be visualized by understanding that for a few milliseconds there is a rush on updating this single product's inventory. This rush is by 20 PHP scripts (one for each customer-Browser) and by the one server-application's software, all wanting to do its math on the same inventory value at the same time.

Which of these "rushers" gets to update the database first? If the 50 items broken is reported before any of the others, then all is well. But if not, if they all intermix their arithmetic in some other combination, then the final quantity for this product will not be correct. It will not be correct because the product's inventory may be reduced by 50 during a millisecond when one or more of the other "rushers" do not see it. This may happen because of quad-core parallel processing and the caching of data in ram. The server-application's software can subtract the inventory value by 50 independently, and outside of the control of the shopping cart's caching logic. This subtraction of 50 items may happen in the middle of some of the PHP scripts doing their own math with "old data", while others do the math with "new data".

However, with the Snippet Engine this conflict can never happen. It can never happen because the Snippet Engine forces the database itself to be designed differently.

This is the innovation: That the database is designed to be managed and controlled by new technology, by the Snippet Engine's software constructs, called Nodes.

Each Node has its own software code to do things differently than other Nodes. Your programmers write the code for each type of Node, whatever code is required to manage and control one small piece of the whole task. Each type of Node will then intelligently manage and control the database portion it has been assigned.

To accomplish this the database is designed and segmented into Snippet Engine software constructs, which will manage and control the database at the lowest-level of CPU-execution. Using Nodes to manage pieces of the database means that your business has direct and intelligent control over every aspect and level of its data, including the synchronization of data with both internal and external entities.

Nodes execute at the lowest level of the computer, as CPU-core-threads, and are assigned by their own code to control one small piece of the whole database. Nodes also receive and send commands to any other Nodes executing on any computer anywhere in the world. Thus, database synchronization and distribution can be designed and managed intelligently, by custom software executing as CPU-core-threads.

Even more simply than a Browser connecting to a webpage, one Node telling another Node to execute a command to reduce the inventory by 50 items is accomplished instantaneously by a simple TCP connection. The math is performed by code in an intelligent manner, and because it is executing as a CPU-core-thread, it enjoys having an unbreakable system lock on the piece of data it is managing.

Nodes are created and deleted as they are needed. Nodes do not have to be deleted, most Nodes will remain forever. Such Nodes are automatically maintained on disk, and reopened when the Snippet Engine EXE is restarted.

Nodes can contain other Nodes. That is, Nodes may be aggregated to form larger Nodes. For example, numerous unique and individual Nodes may be devoted to managing and controlling their assigned row-element within one table of the whole database. These many Nodes are aggregated to form a larger Node that knows how to manage the table itself, and all of the “row-Nodes” too. This means that if an external software entity knew exactly which row of the table they wanted to query or update, then they could make a TCP connection directly to that single lower-level-Node that is managing that singularly assigned row-element. This innovative capability means that the typical overhead of Internet / database bandwidth is logically distributed, without overhead, across the lowest levels of all Snippet Engine databases.

Using the Snippet Engine’s innovative database design technology, the PHP scripts, the shopping cart’s software, and the server-application’s software, these now send a simple TCP command to a Snippet Engine Node to update the database in a software-intelligent manner. Because the unique Node doing the inventory math is a CPU-core-thread, it has a system lock on its data, which means that it cannot be interrupted or preempted by any other software until it is done. Thus the inventory math is both serialized and ensured to be accurate.

Further, Node commands can have different levels of priority. This means that the command from the server-application may get executed first, or last, or whatever else is required by your business. Because each Node has its own code, complicated updates could even postpone some commands coming in.

Very important to understand, is that any software entity which can make a TCP/IP connection to an external URL, can also make a connection directly to any Snippet Engine Node in the world. Once connected, commands and data are exchanged instantaneously. This means that the existing software of any Order Fulfillment Center,

or database server, can be slightly modified (15-20 lines of code to make the connection and exchange data) to interact with a Snippet Engine Node.

SUMMARY

The Snippet Engine technology enables programmers to use standard TCP/IP connections to communicate instantaneously with other software running anywhere in the world. More, this communication is between software executing at the lowest level of the CPU's core. This means that there is no overhead between elements of diverse databases. Data updates between databases are direct, immediate, and simple.

This new technology is the latest innovation to Internet communications, and the business opportunities to take advantage of this new technology are infinite.

Z2 Computer Solutions will form a strategic partnership with your business. We solve the headache of how to design and manage your computers, databases, and Internet needs. This lets you concentrate on managing your business needs.