

# COMMUNICATING WITH SAM

## Content Networking:

### Linking Your IT and Marketing Strategies

First of a 2-part series...

#### Question:

In order to stay competitive, our marketing department has requested that we increase the functionality of our Web site. Over the past few years our Web presence has evolved from information only to performing basic transactions. The strategy has been driven primarily by marketing and most of the transactions are currently performed in static and isolated Web specific applications and databases developed by marketing, as opposed to being integrated into our corporate back office. However, as you can imagine, this is becoming increasingly more difficult to manage. It has led to many new servers, secondary databases that require complicated synchronizing with production systems and independent applications isolated as independent islands outside core IT management practices such as availability management.

To improve service levels and responsiveness of the applications, we have determined that the Web site must provide a secure environment to serve dynamic Web data such as order entry, order status, real-time inventory and pricing queries. As many customers have complained about outages of certain Web applications, availability is also a concern, and as such we have prioritized the implementation of a second hot site backup of all Web content, along with the associated network and Internet connectivity redundancy. Although the Web site will look and work essentially the same for our customers, this change marks a dramatic shift in IT strategy.

#### Answer:

While the debate still rages as to whether anyone will ever make money on the Internet, one sure bet is that the Web is integral to the marketing efforts of most organizations. For many companies, the investment decisions have moved from justifying incremental investments with incremental transactions from an online outlet, to improving traditional metrics such as improving customer service levels or reducing the cost of each order transaction.

Over the past two or three years, the marketing thinking behind the Web has matured, and concurrently so has the front-end interface that we present to consumers and customers. Graphic laden sites that appeared to be a random collection of disparate applications that threw every bit of corporate propaganda at the browsing visitor have been replaced with simplified user-friendly sites that present only the essentials and focus on self-service pulling of information. While the presentation has been simplified by revised marketing strategies, the engine of delivery has often become more complex.

The marketing departments of many organizations such as yours have solved these dilemmas by adding new applications and databases, often developed in isolation for a specific corporate department or need. Many of the systems have been developed and implemented outside the corporate IT practice, and often they even reside at a third party site hosted by the specialized company that developed the application for marketing. The result is that more, not fewer, servers have popped up at a time when many data centers are trying to consolidate servers. Many of these niche purpose servers suffer from less than optimal utilization,



Sam Johnston

Our current Web site primarily resides on our production AS/400 and serves static pages only, and provides links to the generally static applications developed and managed by marketing. Our current security environment consists of a straight up Internet infrastructure with two layers of firewalls (multi-vendor) creating a DMZ between the firewalls where the Web application servers reside. On the inside of the internal firewall the production databases reside. We have implemented IDS sensors on the external network, DMZ and production network as well as host based IDS on our key systems.

If we pursue these changes, the Web site will start relying on applications and databases on our local AS/400, as well as those residing on servers located in our affiliated companies around the world. However, the growth of demand on our systems has increased the load exponentially on our network link and has created some peak processing bottlenecks on our network resources and web system processors. This has necessitated my staff working on a redesign to increase our capacity. Additionally, while increasing capacity, some critical business processes are migrating to the e-business strategy and availability of the system is more critical than ever. How do we achieve increased performance and also increase availability in the most cost effective manner?

and with many of them located at third party locations extraneous to the corporate network, availability and network bottlenecks can often be an issue.

In simple terms, many organizations still are not managing their Web applications with the same disciplines that are applied to other corporate applications such as ERP. While the marketing strategies have matured, the IT strategies often have not, resulting in inefficiencies. Is this a result of sloppy IT practices? Perhaps in some cases, but more often than not it is more related to how the Internet has evolved through mostly trial and error by marketing departments looking for a competitive edge. If we had subjected Web development to the same IT rigors as say an ERP implementation, would we have progressed so far in such a short time? Likely not. What you are identifying is that now that marketing actually has defined the application needs, we need to play catch-up from an IT management perspective in order to refine these applications and make them truly production-ready.

This need has driven the evolution of whole new discipline dedicated to ensuring that rich content is delivered effectively within the Intranet and to the Internet. While we think primarily of marketing's efforts to sell our products, we need to remember that the Internet has transformed many other aspects of corporate life, whether it is training via e-learning and video streaming, or e-commerce to connect with our supplier relationships. Many of these applications, as you have noted, have for the first time globalized multi-national organizations that previously operated each theatre independently.

While there are many benefits of using electronic means to deliver content, the process can be frustrating for users if not done properly, and you need to understand the implications of rich content delivery.

- o **Content control** – the e-business model makes it easier to control the entire information distribution process, often centrally, but inadequate

infrastructure to facilitate easy access to the content will frustrate users.

- o **Cost savings** – content distribution via the Web can reduce costs by eliminating the use of say CD-ROMs to distributed training modules, but again if the content cannot effectively be delivered than the training may never reach the employee
- o **Global reach** – using the Web for content delivery gives every organization a 7x24 reach, but if a customer cannot access your content at 3am will they wait until the next day to call you or move to your competitor?

As the Web has moved from incremental to mainstream in the business plans of most companies, the inability to effectively deliver rich content electronically has become mission critical. However, the traditional Web architecture of centralized Web servers to deliver content to all points have created weaknesses that need to be addressed.

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These issues include the following:

- o **Reduced Availability** – single data centers, servers or network connections create single points of failure and make maintenance windows difficult to find
- o **Network Link Congestion** – more users, more content, more applications equal bottlenecks in the network as packets converge on centralized resources
- o **Network Equipment Congestion** – increased traffic and content means more packets, often taxing equipment and creating queues

- o **Web Server Congestion** – content requests tax servers, and single centralized servers can create queues and delays for users waiting for others to be served
- o **Distance Delay** – often the resources can be located in remote locations, creating delays associated with data transmission over long distances

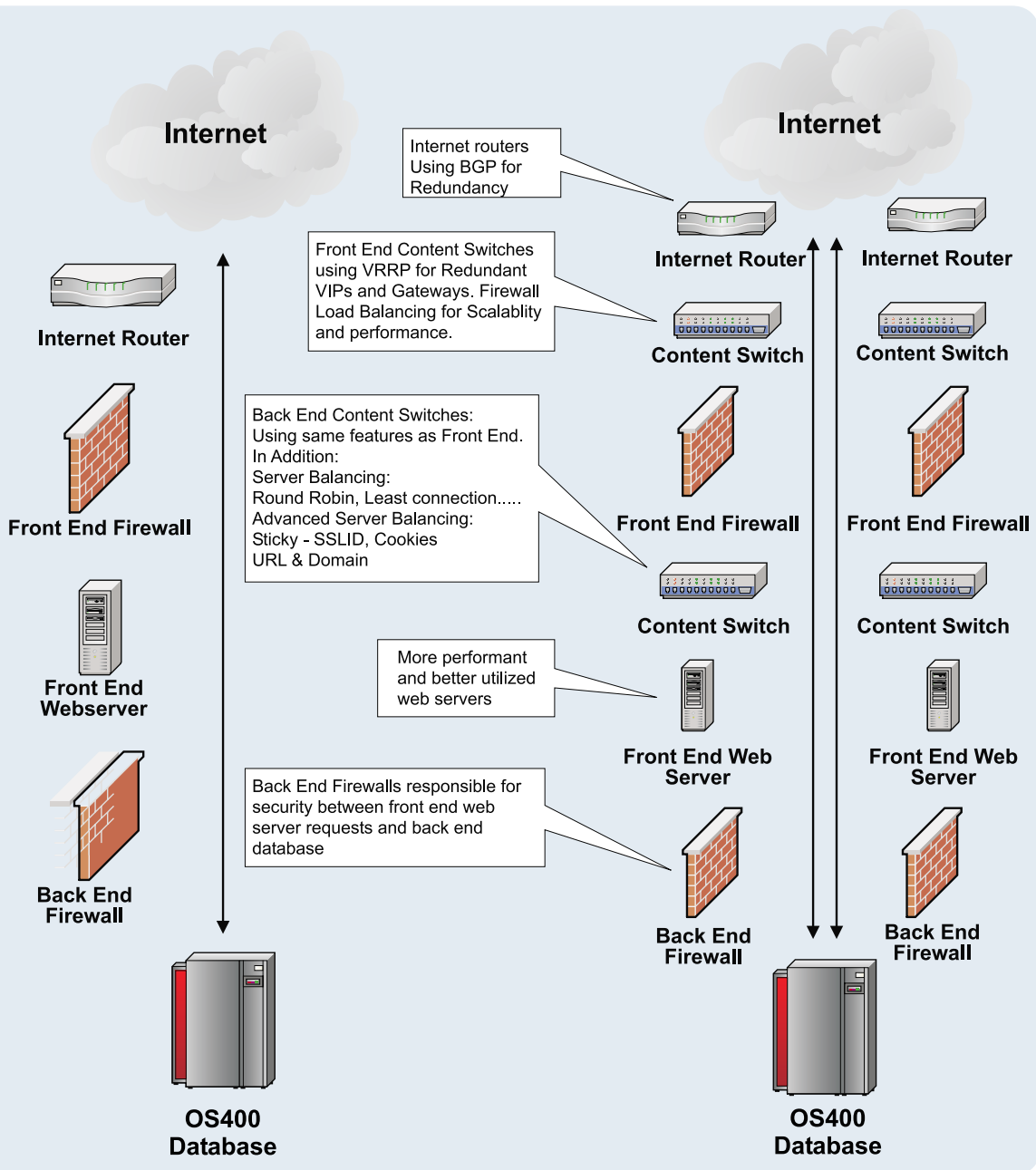
These issues are not new. Traditional methods for solving these issues have been through the indiscriminant addition of more bandwidth, deployment of geographically distributed servers, and the

addition of redundant links and paths. Although these solutions did provide short-term benefits, as Internet traffic continues to grow, the inability to intelligently manage these tactics means that these strategies do not achieve economies of scale, and in fact the costs often increase exponentially relative to the capacity they generate.

The need to find new technologies to scale Web technologies was foreshadowed in 1999 by Forrester Research in *Scaling Web Performance*, March 1999. *“Over the next two years, a whole new layer of infrastructure that Forrester calls ‘content routing’ will emerge. This will optimize content delivery by linking applications with distributed network servers, and distributing requests across the network to maximize user performance.”* The discipline that has emerged is known as Content Networking, and in a short time has become widespread discipline adopted by most organizations serious about the Web.

Content Networking permits Web scaling by adding an intelligent layer to the network architecture for managing content requests in order to optimize the use of all Web resources, be it servers or bandwidth. The foundation of Content Network is two principles:

- o **Distribution of Content to the Edge of the Network** – Servers are placed close to the content requests, and unlike cache servers, content is replicated to the server so it can be served multiple times versus being pulled by a user request, thus economizing on resources as bandwidth is used once and content is available faster due to re-population of data.



- o **Redirection of Content to a Local Source** – Content network intelligently looks for the optimal resource to provide the content, criteria such as geographic and network location, presence of content, current status of the server (availability and load) and current status of the network (bottlenecks, availability and errors). Efficiency is maintained via centralized control of the content and network, meaning that a single URL is associated with content regardless of the number of servers needed to deliver the content.

Like any technologies, there are various layers and implementation methodologies that can be used to achieve Content Networking, and of course a multitude of vendors willing to sell you all or some of the pieces. Before selecting your architecture model, you should establish the evaluation criteria that will be used to make decisions. Some of the criteria you should look at include: flexibility

for incorporating all types of content media types via a single architecture; ease of use and administration, including centralized tools for co-ordination of dispersed activity; scalability for investment protection and to avoid service disruptions; cost of deployment and ownership minimization via tools for simplified management, and; seamless integration and inter-operability with existing security and Web systems.

The key elements and layers that you need include in your overall Content Networking Architecture are as follows:

- o **Content Distribution and Management** – By inserting content engines and content networking devices into the network, you gain the intelligence to manage content distribution centrally regardless of the number of devices involved in the content delivery, as well as assign the network policies and perform the network management necessary to optimize resources.

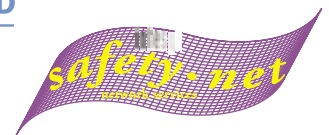
- o **Content Routing** – This layer provides the ability to re-direct traffic to the best location in the content network using criteria such as presence of routed connection, geographical location, network status, and content engine health and load.
- o **Content Switching** – This permits you to intelligently switch and load balance traffic across multiple servers, often in multiple locations, to optimize resources and permit the minimization of the number of servers required.
- o **Content Edge Delivery** – Using content engines that contain streaming servers, content is delivered from the edge of the network to the desktop to minimize the network resources needed to support network intensive applications, which ensures that the user gets optimal application performance.
- o **Intelligent Network Services** – It is crucial that other network disciplines be used to compliment the content network.



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This includes using network security devices such as IDS (intrusion detection sensors), firewalls and two-factor authentication so that you can freely permit access to content in a controlled manner. It also means using technologies such as QoS (Quality of Service) and Multicast to optimize network performance.

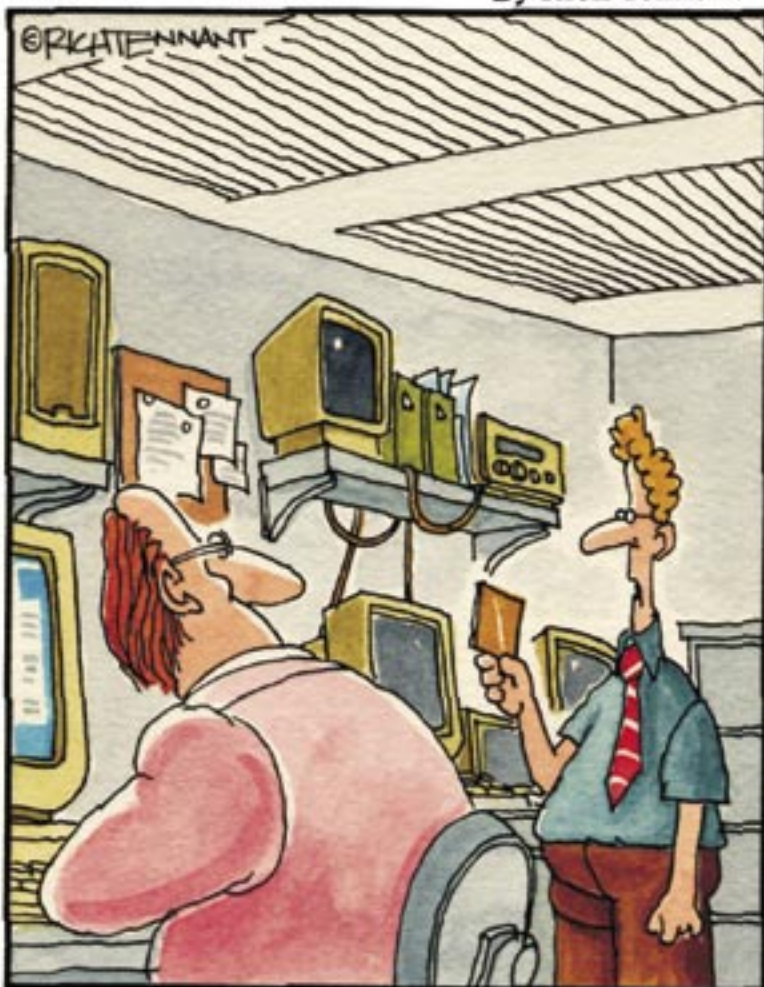
Specific to your scenario, it is crucial that you go through a formal evaluation process to determine if Content Networking is right for you. However, based on your current situation, there are a number of technologies that we can comment on to help increase performance within your Web application delivery framework. Additionally, there are also options that inherently provide increased availability as they provide improved performance.

In part II (in the next issue of this magazine) we will focus on these options as cost effective solutions to your challenge. It is not clear where your performance issues may truly reside but this discussion will address the most common points and talk to a solution for your needs. **TUG**

*Sam Johnston is a partner and Chief Technology Officer of Intesys Network Communications Ltd., providing value-added networking and e-commerce solutions to the iSeries community. He can be reached at (416) 438-0002 or via e-mail at [sjohnston@intesys-ncl.com](mailto:sjohnston@intesys-ncl.com). Any TUG member wishing to submit a question to Sam can forward their typewritten material to the TUG office, or to Intesys. The deadline for our next issue is Friday October 11th, 2002.*

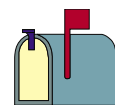
## The 5th Wave

By Rich Tennant



"I ran this Bob Dylan CD through our voice recognition system, and he really is just saying, 'Manaama-manaabadhaabadha...'"

**@tug.ca**  
(...we got mail!)



Priority: Urgent  
From: Léo Lefebvre  
Re: **IBM / TUG Education**

Hi all:

This is just a note to let you know that TUG and IBM are planning a very special joint education session on **Wednesday, October 9, 2002** at the IBM Lab in Markham, Ontario.

The topic is **"INTRO TO WDSC"** (Websphere Development Studio Client).

This course will be highly technical (none of that "sales stuff") and is taught by the actual lab people who work on WDSC.

The cost is \$149 CAD for members, or \$199 CAD for non-members, and will include lunch and coffee-breaks.

To register, contact the TUG office at [admin@tug.ca](mailto:admin@tug.ca) or 905-607-2546.

Best Regards,  
Léo