The Application Delivery System Market

Net Forecasts – Peter J. Sevcik
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There is a natural layering of technologies in enterprise computing, from application software to the microprocessors that execute the software. The layers permit technology change and provide foundations for building a variety of solutions. These layers are often described in a vertical function hierarchy from the physical to the logical constructs of a system. Value increases in a single direction (bottom-up).

I propose that there is another, horizontal view that is equally valid and more applicable to networked applications: From consumer to information. Consumers of information "travel" digitally to the information they desire, over layers of interconnection technologies.

In this model, value increases bi-directionally and symmetrically (edge-to-core and back again, like an onion). The core of the onion is a network.

Big Networks Don't Change

When a new communications paradigm is introduced, it rides on the wave of a new network technology. It completely changes how information is distributed, processed and viewed. We had such a revolution with the telephone network, followed by TDM data networks and most recently by packet networks.

At the start of the revolution there is a renaissance period of innovation, followed by a long period of relative technical stagnation. In the horizontal model, stagnation first occurs in the network, which gets too big and complex to replace. We are there with the Internet.

However, the need and desire for new and innovative applications does not diminish. Instead, people invent new layers to adapt the applications to the network. Let me show an example.

The telephone network was designed to carry the voice of white males anywhere across the globe. It was a technologic achievement that enabled all kinds of new business processes. Then came the computer that only spoke in binary. Did the telephone network adapt to the new application? No, computers could not use the telephone network until the invention of the modem. The modem adapted the bits into an analog signal that fit the specification of the male voice.

Many decades ago it was discovered that Asian voice--particularly a Chinese woman's voice--does not fit well into the sound spectrum of the original Bell System design. Today, there are more phones in China than in the U.S. Did the newly installed networks adapt to their unique user needs? No, the networks in China comply with established ITU standards.

The lesson is that once a network technology is successful, it is so widely deployed that it is impossible to change the technology in any significant way. We are at that stage with packet technology. The world has standardized on Ethernet access and the TCP/IP protocols. Notice how hard it is to get the much-needed IPv6 deployed. New initiatives to get IP-based quality of service (QOS) to work across the Internet are not plowing new ground but rather trying to raise the Internet to a common ground of compliance. So let's just accept that there is no "next generation" network around the corner.

Yes we are extending its reach with wireless. And there are alternative access methods that operate in the physical layer. But all of them use the same IP network layer. So there are new network technologies to discuss, but they do not fundamentally change the architecture of the transport system. Furthermore, the network will not adapt to the users--much to the surprise of all the "adaptive networking" proponents.

The Application Delivery System

The above realities would be expected to act as a damper on new applications, yet new applications continue to be invented at a headlong pace. Developers that are connected to clean, high bandwidth/low latency LANs design these

applications. Then when the application is deployed onto the dirty, low-bandwidth, high-latency Internet, it does not work so well.

At that point, there might be the impulse to either change or abandon the application. Change is out of the question. Getting developers to build a WAN-savvy application is the same as asking Microsoft to build more CPU-efficient software. It won't happen.

At the same time, however, people don't abandon the application. They just need an adaptation layer so the application will work properly on a WAN.

Going back to the onion view, we must grow a new layer around the network and under the outer skin of application servers, PCs, PDAs, etc. This new layer is already here under a variety of names: traffic shaping, application performance management and others. But it is transitioning into a full-fledged architecture layer that I call the Application Delivery System (ADS).

The Application Delivery System is the stuff that makes new and different applications work on the old existing network. It changes, pulls, pushes, converts, protects and does amazing things to make what would be a bad application become a good application. But one of the absolute hallmarks of ADS is that it does not change anything at the ends. The axiom is, "The user can't tell the difference." What the origin server put out is what the consumption product shows.

Note how every discussion of a new technology to make things really work on the Internet starts with, "TCP/IP was originally designed for file transfers among big hosts, but it does not work that well for this cool new thing, so we are going to change a few things under the covers." Yet while performance may be the original motivation, the solutions are becoming a platform for much more.

ADS is Already a Big Market

The ADS market emerged as a series of technical innovations, delivered by point-product companies, that solved specific problems. The list of these techniques is as impressive as it is confusing, and it includes:

- Acceleration
- Transformation
- Linear delivery
- Compression
- Caching
- Transparent turns reduction
- Content delivery
- Client-side rendering
- Enhanced protocol processing

Each solution is made up of two parts so as to keep the symmetrical model: server side and client side. The market can be segmented by the how the two sides are delivered:

Symmetrical Devices--Two appliances, one at the datacenter and a mate at one or many remote locations. The source side performs some process or transformation to the source data flow that is then transmitted more effectively (the adaptation) over the WAN to the destination appliance. The destination appliance then performs an inverse process to deliver the original data to the destination. This process works in both directions transparently to the two endpoints and can support a wide variety of applications and protocols.

Asymmetrical Devices--The process is similar to the one described above, except that the destination "device" is a Web browser. The destination device is therefore, a "thin" software client instead of the "thick" appliance. A great deal can be done to improve how a Web page is described, called for by the browser and delivered to the browser. Again, this is transparent, but operates in only one direction (server-to-browser), and is limited to Web-based applications.

However, many techniques such as compression and caching are common to both the symmetrical and asymmetrical approaches.

Symmetrical Services--This is a deployment variation of the symmetrical devices. An enterprise may not be willing or able to place hardware in every remote location, but can still get the function of the symmetrical device approach through a service offering. Examples include intermediary or "value-added" services such as electronic funds transfer, mail and document exchanges, all of which have existed in networks for a long time.

The new variation on the theme is the Web-based content delivery network (CDN). Although the typical CDN delivers to a browser, it is a symmetrical solution because there is a remote CDN server. Some innovative carriers are beginning to offer more extensive services using enterprise symmetrical devices.

It is important to understand the ADS market in this broad scope, rather than the niche views like compression or traffic shaping. This is because all of these approaches compete against each other as functional substitution (one approach can displace another). They are all variations on an intermediary layer that adapted the application for better delivery.

We estimate that ADS is a $900 million market in 2004, supplied by 45 vendors, and at its current 35 percent growth, it will exceed $1.2 billion next year. The market is clearly big and on the brink of a big growth phase.

The ADS Market is in Transition
As markets grow, the competitive landscape changes. So expect big changes in just a year.

First, each technology is becoming commoditized. In order to succeed, many of the approaches must adhere to standards that make differentiation difficult. This permits all the players to add most of the functions into their solution. Maintaining a competitive advantage based upon any single feature will be difficult. The vendors that hold onto being the best at one thing, like compression, will lose.

Second, there are already too many players in a space that is consolidating functions. The vendors that can't keep up with the function/feature race will fall by the wayside. It will be difficult to maintain niche protection.

Third, how the solution is implemented will matter less over time. Some vendors try to make the case that their internal product architecture is superior, such that they can deliver a specific feature better than a competitor. This reminds me of the battles between Wellfleet and Cisco.

Wellfleet implemented routing in the line cards, which was better than the Cisco central processor architecture. The argument was that if you turned on an obscure feature on the Cisco router, it would slow down to a crawl. It was true, but Wellfleet did not win in the long run. When the market transitions to the features race, you do not have to deliver them all perfectly. The winning strategy is to implement all the features quickly and then make them work well in order of actual need and popularity.

Fourth, the fact that the market is shifting from single technology point-products to multi-function system solutions changes the selling process. Specifically, it changes the justification to buy from saving money (simple ROI, though still important) to providing a comprehensive application delivery vehicle. The leaders are transitioning into supplying a full-service intermediary platform for application delivery--or an Application Delivery System.

This fourth point shifts the sale from a tactical to a strategic buying decision. Enterprises will soon see the benefit from an integrated ADS solution for all their application delivery problems, rather than buying a diverse set of point products. This will challenge the current players, who will need to add scalability, integrated management and proper reporting to their products.

The Winner Is Up For Grabs
This is the most exciting period in a market. It is now big enough to attract attention, yet fractured enough to give many players a good chance at success. The biggest player in this market, Akamai, has only a bit more than a fifth of market share. Furthermore, the market is evenly split along the segments described above:

Symmetrical devices – 25 percent
Asymmetrical devices – 38 percent
Symmetrical services – 37 percent

Asymmetrical devices may look like they have an early lead. But this is because they are simpler to deploy. However, the asymmetrical approach has limited long-term capability, since any major upgrade will require upgrading all the browsers in the world. Symmetrical devices are the fastest growing segment. Furthermore, the leading vendors in this segment best understand the transition from product to platform and are building toward the ADS vision.

So there will be winners in each of these categories, and it will be some time before a single vendor really dominates this space. Early indications of the long-term winners will come from shifts in market share by segment. Stay tuned.

Invitation

I invite readers to attend my new tutorial on the topic, Emerging Delivery Systems for Improving Networked Application Performance, at the Next Generation Networks conference, November 1, 2004 in Boston.

Companies Mentioned

Akamai (www.akamai.com)
Cisco (www.cisco.com)

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