

Why Did F5 Buy Acopia Networks?

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On August 6, 2007, F5 Networks announced its intention to buy Acopia Networks for \$210M cash. The acquisition has raised some eyebrows in the investment community due to lack of understanding of how the technologies of these two companies are synergistic and whether the sum is greater than the parts. We believe this is a strategic move on the part of F5 and its implications will become clear over the next twelve months, as customers start to put the combination of these products together in their data centers and remote locations.

To understand how these technologies mesh with each other one has to understand the vision of the next generation data center. We describe that below and look at how we believe F5 will position Acopia Network's technologies to gain a strategic advantage over its competitors.

Vision of the Next Generation Data Center

At the macro level the visions presented by the behemoths such as IBM, HP or Sun are eerily alike. Each calls it by a different name but the essence is the same. IBM's On Demand Computing, HP's Autonomic Computing or Sun's N+1 initiatives are essentially all based on the concept of a data center where fluid pools of compute, network and storage resources are available to serve end user needs. These resources are combined on the fly, based on Service Level Agreements (SLAs) that IT has agreed to deliver in advance to the business group that is paying for that service.

These fluid pools of resources are indeed just that. While the pool may be made up of heterogeneous physical equipment, the physical boundaries are abstracted out using virtualization technologies. In order to meet

the SLA, an application requests and receives just the right amount of resources from the compute, network and storage pools. It retains those resources only for as long as necessary and releases them back into that pool when demands placed upon it are reduced. Similarly, if additional resources are necessary in order to meet the SLA they are extracted from the pool in a non-disruptive fashion and used for as long as necessary.

The user pays for these resources only as they are used and only to the extent they are used. In that sense the model resembles the utility model where one pays for electricity or water based strictly on what one uses.

No more, no less.

In this model, when the total physical resources start to approach full utilization, additional physical resources are added to the pool. If compute resources are reaching

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full utilization then only compute resources are added – ditto for network, I/O or storage resources. Vendors are interchangeable in this model since the model is based on a set of standards. End users pay for what they use. Resource utilization is optimized. Waste is minimized and IT efficiency is consistently high.

In this rarified model, users located in remote office locations or in the field are served as if they were physically co-located in the data center. They perceive no degradation in application performance and they have access to all the data they need in a transparent fashion.

Contrast this to the reality of the data center today.

Reality of today's data center

In reality, today's data center is a mishmash of heterogeneous physical devices with hard boundaries. The size of the server is decided upon based on the application that will run on it. The only way to meet the needs of the users at all times is to pick an application server based on its ability to serve the peak load. When application load is low compute resources lie idle.

The exact same logic applies to choosing the type and amount of storage or network. Over provisioning of storage is rampant in IT across all verticals today. The reasons are well known and certainly include the need to service peak loads but also because provisioning of storage is a monotonous, time consuming activity and storage administrators shun it much as possible.

Over provisioning is the simple way to deal with this issue. The type of storage is often determined based on peak loads as well. The net result is gross underutilization of resources.

The IT infrastructure looks like a thousand silos of physical servers with their associated storage running one application each. To aggravate matters further, larger companies have hundreds, sometime thousands of remote offices, each with similar silos of complete systems running one or two applications each.

Well, perhaps we exaggerate a bit.

While it is indeed true, broadly speaking, when viewed across all data centers on a worldwide basis, we have made progress in the past decade. The more sophisticated data centers today boast load balanced web tiers; consolidated application servers running VMware; blade servers with much higher levels of efficiency in terms of resource utilization, including power and space; database tiers running Oracle 10g RAC or equivalent; and storage tiers, implemented in a SAN using Fibre Channel switches and directors.

The more advanced data centers have implemented some form of application delivery networks to accommodate remote office workers and utilized WAN optimization tools to keep costs down. Perhaps they have implemented consolidated backup to a central office using replication products. The net result is better utilization of resources and improved data protection than the static model described above.

But in the grand scheme of things we are still closer to the primitive silos rather than to the totally virtualized, highly automated, service-driven data center of our dreams.

With this backdrop let's view F5 and whether or not acquiring Acopia is net positive to them and more importantly, to their customers.

F5 Networks

F5 is a \$500M+ company that has thus far focused primarily on improving delivery of applications and data within the datacenter and remote locations.

Wide Area Data Services

There are numerous products in their arsenal designed to make the transfer of data across a WAN more efficient and a user's experience in using an application more LAN-like. The products reduce the impact of latency, lower the impact of "chatty" protocols, such as CIFS and MAPI, maintain security across wide area links and, in general, narrow the gap between headquarters and remote workers.

In these regards F5 is a classic competitor to Riverbed or Packeteer or Cisco's Wide Area Application Services product line.

Web Tier Virtualization

F5 also has in its arsenal various products that "virtualize" the web server tier. These products effectively allow the outside world to see a single resource pool of web servers and abstract away the fact that the pool is really made up of n potentially dissimilar physical servers running the web server code. The outside world interacts with this layer

with a single IP address and yet the IT administrator can add or subtract resources, depending on the overall needs of the total user base. Load balancing is inherent in these products, as less busy web servers are brought into play transparently. If a physical server fails, others take over its load, without knowledge of or impact to the user, whether human or machine.

This is a classic definition of virtualization applied to the web server layer.

Application Delivery Networking

Additionally, F5 has products that sit between applications and users, managing each piece of traffic that flows in to provide an integrated, universal way to intelligently manage applications. F5 calls this application and network empowerment process Application Delivery Networking (ADN).

For some organizations, ADN means providing secure remote access to applications for any user, anywhere. For others, it means that sensitive customer data never leaves their systems, or that online transactions never fail. The products run the gamut from simple load balancing to complete edge-to-core application delivery. F5 sits inline where applications and users connect on the network, and where they can be intelligently directed based on current conditions. This enables F5 to serve as a single control point across the network – adding intelligence and manageability, off loading applications to free up servers, and often eliminating the need to rewrite applications. F5 uses proactive technology to protect applications from unauthorized

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access and malicious application attacks. F5 products are designed to ensure that applications are consistently available. They are designed to supercharge applications, making them work faster, consume fewer resources, and perform more cost effectively.

Acopia Networks

The simplest way to understand Acopia Networks and its product line is to turn your attention to the world of files and look at what has happened over the last decade to file servers and NAS. Think of NAS as a dedicated file server, an appliance that is honed to do one thing and one thing only: serve files using either CIFS or NFS.

Much like the silos of application servers we described above, NAS and file servers have invaded enterprises over the last fifteen years. Bear in mind that NAS was conceived of as an easy to use, file server that one could drop onto a network and allow sharing of files by users or application servers in 20 minutes or less. This has by far been true of most NAS boxes. The problem is many enterprises have hundreds, sometimes thousands of NAS boxes that have sprung up like rabbits, inside and outside of data centers, local and remote.

The classic saying “I loved my first NetApp, hated the hundredth” is more true than anyone of us can imagine. Much like the issue with application servers, implemented in silos, these NAS boxes present serious issues to IT. For one, each box is self contained, with a certain amount of storage capacity and performance that is only available to a user that connects directly to

this NAS box. The capacity cannot be shared across other NAS boxes. The “seeker” of file service has to know the physical path to this NAS box.

If a given NAS box is maxed out in terms of storage capacity or performance and the one right next to it is 50% available in both these dimensions, their capacities and performance cannot be shared across the physical box boundaries. With hundreds of NAS boxes in a typical enterprise, there are some that are overloaded, others are under-utilized, others that are down for maintenance or due to failure. Yet others are being added. Some are being retired because they are no longer relevant from performance or capacity perspective.

These activities are highly disruptive to the organization and painful to the user of these file services. Management is a nightmare since each box has to be managed separately. Data protection is inconsistent at best and shoddy or non-existent at worst. Duplication of data is rampant.

In order to balance the load across various NAS boxes the IT administrator has to “disruptively” move data from one NAS box to another. Subsequently, IT has to make code changes to every client that received services from that NAS box so it knows the physical path to the new box containing the data.

If you think we exaggerate in this regard all you have to do is to make a site visit to a large NAS shop. It is not uncommon for a horde of IT administrators to be doing nothing but making these changes every day. Pure,

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mindless activity that produces no real gain for IT or for business.

Enter Acopia.

Now visualize the same IT shop with one or more Acopia Network's Network File Management (NFM in Taneja Group's terminology) switch placed logically in front of all the NAS boxes in the environment. All clients are pointed to this NFM switch's IP address. Namespace(s) generated by each physical NAS is aggregated by this switch such that there is only one Global Unified Namespace (GUN in Taneja Group's terminology) visible to the clients.

The clients only need know to go to one place and seek files services they need. NO changes are ever necessary on the client side. In effect what we have done is *virtualized* all the file services. We have abstracted away the physical NAS boxes and are presenting a logical namespace to the clients.

The benefits are multiple and similar to those received on the web server or the application server tier side. Physical NAS boxes can be load balanced, data can be moved from one box to the other without disrupting service to the clients and failure of any one NAS box is transparent to the clients—other NAS boxes pick up the load.

All NAS boxes are now managed as one and from a central location. Even remote NAS boxes can be made part of the global namespace, extending all the above benefits on a global basis.

There are other benefits to be sure but these stand out. By now the reader should recognize these as universal benefits of virtualization. Actually, what we have described here is indeed an exact case of file virtualization. File virtualization, or more broadly speaking, File Area Networks, or FANs, are a relatively new concept that is making dramatic impact on those IT shops that store and manage large amounts of unstructured (read: file) data. Acopia Networks squarely plays in that space.

By now the reader would have begun to see where this is going and where the synergies lie between F5 and Acopia.

Both companies have focused on solving different pieces of the problem we see in today's data center. Each company has the same vision of the ultimate data center that is built upon abstracting the physical layer with a logical, or virtual, layer. Each has addressed different parts, based on its inherent expertise.

Taneja Group Opinion

The existing non-virtualized methods of delivering application services, both locally and remotely, are archaic. So are the current methods of managing file resources (think of file services as an application just like SAP or another). The current methods demand huge increases in administration as the number of applications and the amount of data grows. At current rates of growth the current methods will take IT headlong into a wall.

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The way out is to abstract away the physical and deal with the logical. This is the concept of virtualization.

Today server virtualization is being added to IT shops at a booming rate because IT has seen the benefits: vastly improved utilization rates, reduced CapEx and massive improvements in flexibility. Granted storage is further behind but storage virtualization products are starting to make serious inroads into the data center, for similar reasons.

F5 Network's acquisition of Acopia Networks tells us that 1) F5 management team shares our data center vision, 2) they recognize that while the route to end users might be

through large, legacy players, the innovation in products will come from smaller players, such as Acopia, 3) file virtualization is a critical piece of the puzzle that they did not possess but needed, 4) enterprises, large and small, are beginning to purchase file virtualization products, regardless of the other F5 elements, and finally, and very importantly, 5) the combination of F5 and Acopia products will produce a solution greater than the sum of the parts.

We think it is a strong indication that "F5 management gets it." We think the next 12-months will make it abundantly clear as to the value of this acquisition! Bravo!

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