The active advantage: why networking leaders are embracing active-active clustering for ADCs

At long last, datacenters have a more efficient high-availability deployment option for application delivery controllers. According to new research, that’s welcome news among IT leaders.
Few people outside IT know much about application delivery controllers (ADCs), the Swiss army knife appliances that perform load balancing, caching, SSL offloading and a host of other vital datacenter tasks. Almost everyone inside IT, though, understands exactly how essential ADCs are to network uptime and performance.

“They’re one of the most critical parts of the datacenter. You’ve got all your applications going through them,” says Graham Melville, director of product marketing at Citrix. In fact, ADCs play such an important role in network operations that for years, most organizations have deployed them in high-availability (HA) active-passive pairs, in which one unit actively provides services while the second sits passively in standby mode, ready to leap into action should the primary device fail.

Not surprisingly, therefore, 76 percent of survey participants presently deploy half or more of their ADCs in active-passive pairs. The problems they face as a result, however, go beyond wasted money and unused capacity to encompass issues such as poor scalability. “When the controllers in a high-availability pair reach their operational limit, your only option is a forklift upgrade of both devices,” Melville says, “it’s very expensive and introduces a lot of disruption.”

Needless to say, the possibility that a backup ADC won’t be available when it’s needed makes many IT executives nervous. Indeed, fully 35 percent of them are concerned about the preparedness of their passive-state ADCs, according to the IDG Research study. They have good reason to worry: about three-fifths of survey respondents suffered an ADC failure in the previous 12 months.

That figure sounds about right to Sam Jacobs, director of technology development services at IPM, an IT consulting firm. “Quite a number of our clients have experienced unexpected failovers,” he says.

Plus, the passive half of an active-passive ADC pair is a little like the spare tire in your car’s trunk: if there’s something wrong with it, you probably won’t find out until the worst possible time. According to Jacobs, “You’re constantly hoping that the passive ADC is fully functional and ready to take over when a failure occurs. Although there are checks on the passive unit, you never really know for sure if it’s ready until there’s a problem with the active unit. The law of averages rather than poor ADC build quality is responsible for that phenomenon.

“It’s just standard probability,” he adds. “The more ADCs you have and the longer you have them, the likelier you are to experience a failure.”
**Double the capacity at no added cost**

Active-active ADC clustering is the answer to the active-passive deployment model’s worst shortcomings. For starters, it reduces waste and heightens return on capital investments by eliminating idle resources. “With active-active, multiple devices share the workload,” observes Laliberte. “Theoretically, you could double the capacity and make full use of the infrastructure you have bought.”

Active-active ADC deployments also lower operational expenses by simplifying management. From an administrative standpoint, a well-designed cluster functions like a single logical ADC, so technicians can manage all of their nodes at once. “You have a single policy management view for the entire cluster, so if you make a change to any device it gets propagated automatically to all of the others,” Melville says.

Adding capacity to the cluster as workloads grow is simple, too. “All you have to do is put another ADC in and you immediately increase your horsepower,” he says. Add a third ADC to a two-node cluster, for example, and you instantly get 50 percent more capacity with no downtime and far less capital spending than a rip-and-replace upgrade.

You also get better reliability. “By design, there’s no single point of failure in an active-active cluster,” Melville notes. “If any node fails, the remaining ones are available to work for all of your applications.” Since every controller in the cluster is active, technicians needn’t worry about the readiness of the backup ADCs. “In the event of a failover, you have full confidence that both ADCs are operational,” Laliberte says.

Furthermore, every node in an active-active cluster shares and synchronizes session-level information, so device failures have no meaningful impact on users. “There may be a slight lag, but users should not lose their sessions,” Jacobs says. Better yet, in normal operation, most users will experience improved application performance and responsiveness, because the otherwise passive half of an active-passive pair is hard at work. “You can take advantage of more of the resources on both ADCs,” he notes.
As an added benefit, you can cope more successfully with unexpected traffic spikes, whether benign or malicious. “You’ve got twice as much power to draw on, so twice as much resistance to a denial-of-service attacks,” Melville says.

**Unique capabilities**

Only one ADC equips datacenters to capitalize on the advantages of active-active clustering. “NetScaler is the first and currently the only full deployment of that technology in the ADC space,” he says.

The TriScale Clustering feature in NetScaler is the key to that achievement. TriScale “stripes” virtual IP addresses representing application termination points across all of the devices in a cluster, enabling each of those devices to support all applications simultaneously. The result is a dramatic jump in availability. “Should a node ever fail, the others automatically distribute the workload evenly among themselves,” Melville says.

Further, TriScale Clustering keeps scalability high by allowing you to add capacity in multiple ways: scale the system up using Pay-as-You-Grow licensing; scale it out by incrementally adding nodes; or scale it in with the help of NetScaler SDX, a sophisticated virtualized architecture that allows businesses to run multiple NetScaler instances on a single hardware appliance. “It scales really, really nicely,” Jacobs says.
Technology executives such as Todd Hill, a participant in the IDG Research survey, appreciate the flexibility to deploy the NetScaler Clustering system as either a physical or virtual appliance. “Virtual allows me to spin up instances faster than adding new hardware,” says Hill, who is manager of hosting operations for payment processing solutions at Jack Henry & Associates Inc., a provider of software and services to the financial services industry and other verticals.

Manageability is another NetScaler strong point, as the system allows technicians to make the full capacity of an entire cluster available to all of their applications at once. “That’s a lot easier than constantly reassigning application responsibility manually to a properly sized ADC capable of handling a given load,” Melville observes. As a result, administering a NetScaler cluster takes less time and money.

Best of all, its reliability, scalability and manageability make NetScaler the perfect fit for today’s cloud-based datacenters. “Cloud computing is all about maximizing resource utilization and economies of scale,” Melville observes. “With NetScaler, you no longer leave half your ADCs unused, and you can grow and manage an enterprise cloud network easily, regardless of your level of cloud maturity.”

Ardent admirers
As it happens, NetScaler strengths correspond closely to the ADC features most desired by participants in the IDG Research survey. Indeed, 55 percent say access to both physical and virtual form factors is an important ADC selection criterion, and 48 percent say the same of intuitive management functionality, while 56 percent cite high or on-demand scalability as a priority. Hill is among them. “There [are] two things I always look at: scalability and performance,” he explains, mostly because the infrastructure he’s responsible for is under constant and heavy pressure. “We push about 1.5 million transactions a day through the system.”

Respondents have no trouble understanding the value proposition of active-active ADC clustering. Approximately three-fifths say they would definitely or probably deploy an ADC solution that doubles performance without requiring additional hardware investments.
Importance of Criteria Associated with ADC Vendors

- Integration with existing data center infrastructure: 70%
- High or on-demand scalability of solution: 56%
- Support for both hardware and virtual appliances: 55%
- Simplified solution management: 48%
- Low cost solutions: 43%
- Demonstrated ROI: 35%
- Perception as data center category leader: 20%
- Uniqueness of solution: 14%

SOURCE: IDG RESEARCH SERVICES, APRIL 2013

The more IT managers know about ADC technology, the likelier they are to agree. A whopping 80 percent of survey respondents who consider themselves highly or somewhat familiar with ADCs say they’d be interested in a solution with active-active clustering capabilities. “And why not,” Hill asks, “given the time and money such a product would save them? It would be a lower cost than having to put more devices out there.”

Thanks to NetScaler, this is no longer just a theoretical option. “Using a fully clustered pair of ADCs such as NetScaler instead of a traditional HA pair or simple application cluster not only gives higher availability and reliability, but it boosts performance and allows for seamless future expansion,” Mehra says. Based on IDG Research’s data, that’s welcome news among IT decision makers.