



White Paper

Get Control of Your Data Center

APV Series Application Delivery Controllers

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Introduction

Data center and networking technologies have become enablers that virtually all organizations rely upon for supporting business operations and gaining competitive advantages. When people think of the data center, servers, databases, storage, firewalls, accelerators, switches, routers, telecom equipment and backup power all spring to mind.

But the data center involves more than just technology. It is the human factor that decides what goes into and connects to the data center. So it begins and ends with the people acquiring, deploying and maintaining data center technology. If something goes wrong, the ones who suffer are the people using the technology and those responsible for keeping it running. And so it is the ability to control technology – to "keep it running" – that is of utmost importance.

Gaining Control

Application delivery controllers (ADCs) provide IT personnel with greater control over their infrastructure, allowing them to leverage existing data center resources to meet the dynamic nature of today's business and operational imperatives. ADCs address a variety of common problems that arise once applications are deployed in and delivered from the data center. By using ADCs to gain greater control over infrastructure, IT can proactively eliminate problems before they occur – decreasing stress, increasing productivity and saving time and money. ADCs give IT the ability to quickly map application delivery solutions to new business initiatives by flexibly implementing business logic across data center infrastructure to achieve both technical and business agility. Common challenges addressed by ADCs include:

- Unanticipated traffic spikes
- Network latency and congestion
- Overloaded servers which are unable to keep up with traffic demands
- Adding, upgrading and removing servers
- Network and application security breaches
- Aligning new business requirements with existing data center technologies
- Excessive cost in supporting the items above
- Data center modernization, e.g. IPv6, 10GbE, virtualization, 2048-bit SSL data encryption and cloud services

The Air Traffic Analogy

Because ADCs control traffic going to and from clients, servers and back-end databases, air traffic control is a good analogy for describing their role. Air traffic control is a service provided by ground-based controller systems to expedite and maintain the safe and orderly flow of air traffic. Their primary purpose is to separate aircraft to prevent collisions and to organize and expedite traffic flow. Similarly, ADCs separate IP traffic to ensure critical applications don't conflict with one another over the network. ADCs also accelerate traffic flows and maintain policies that distribute traffic to specific servers based on business requirements while optimizing overall server resources.

Like too many planes in the sky, today's servers are being consolidated using virtualization technologies. Compounding the problem, multiple applications are being consolidated onto less hardware to reduce costs associated with software licenses, power, space and cooling. Without proper traffic control, data center consolidation can overburden server resources and network connections, causing poor application performance.

Application Traffic Control

An organization's ability to drive business-critical imperatives relies on their IT department to translate business requirements into business logic (functional algorithms that manage information exchange). In order for applications to work properly across multiple and diverse servers, devices and network links, business logic needs to maintain persistent connections to keep users in sync with servers and back-end databases for completing transactions such as making changes to a file on a remote SharePoint server or completing a financial transaction over the Internet via a smartphone. For instance, when a remote client edits a file and then saves a new version of the file to a remote SharePoint server, these actions require the client to be validated and for the connection to be persistent with the server and database that originated the transaction.

If an e-commerce customer is purchasing an item online, goes to lunch in the middle of a transaction and then returns an hour later to complete the transaction, the same originating server will be needed to complete the transaction. If the store's Web site system is not set up to support this capability, the transaction will be broken and the client must begin the entire process again. What's more, all applications sent over the WAN are subject to delays and disruptions from latency and congestion – and applications themselves can cause a wide range of problems due to inefficient TCP and application protocols as well as non-essential and redundant data being sent over the WAN. As Web application deployments have grown, so have their complexity, costs and impact on server resources and WAN performance.

Array APV Series ADCs help overcome server bottlenecks and network congestion. Offloading servers allows the data center to handle more traffic. Squeezing more traffic into WAN links provides the most effective use of the available bandwidth. As a result, service providers and enterprises are able to support a greater number of users and deliver more applications without adding more servers and bandwidth.

APV Series appliances speed server response times and optimize WAN traffic from the data center to remote users. To achieve the ultimate in application delivery optimization, the APV appliances utilize a combination of Layers 2-7 server and device load balancing, global server load balancing and failover, link load balancing, SSL offload and acceleration, Layers 4-7 security, dynamic content routing, traffic shaping, TCP offload and connection multiplexing, adaptive compression and dynamic caching technologies. Importantly, because most features are executed at the kernel level, APV appliances maintain unmatched levels of system performance with multiple, concurrent features enabled.

Keeping pace with application, user and data center trends brings many challenges to application delivery. Array APV Series ADCs are becoming the go-to solution for delivering the scalability, availability, acceleration, security and control required to:

- Simplify complex IT infrastructure
- Easily add and remove servers without interrupting application delivery
- Flexibly direct traffic to optimal servers and data resources
- Optimize network utilization and save on bandwidth costs

- Flexibly scale server resources to handle traffic growth
- Protect applications and the network from hackers and internal security breaches
- Enable new business requirements to be easily adapted into existing application delivery infrastructure
- Protect against network and application security breaches
- Align new business requirements with existing and modern data center technologies
- Control costs of supporting the items above

Business Agility Control

APV appliances support policy-driven features that easily and flexibly adapt data center infrastructure and operations to meet evolving business requirements. Cloud computing and managed service providers use APV appliances to improve and automate their application service infrastructure and enable differentiated value-added services for new and existing customers. Telecom service providers deploy APVs to accelerate and optimize their data center infrastructure to better serve and support customers and deliver new revenue-generating services. APV use cases for enterprise data center initiatives and IT outsourcing services include consolidation, distributed and mobile workforces, network disaster recovery, business continuity, SOA, compliance, cloud computing, SaaS and more.

Disaster Recovery Control

When applications are delivered over the WAN, it is not uncommon for links (T1, cable, DSL, etc.) to have an outage. In addition to overloading, other events can cause links to fail, such as network hardware failure, human error and natural disasters such as earthquakes and hurricanes.

APV's global server, site and link load balancing and failover capabilities deliver one of the most important technologies in solving the problem of reliability for WAN and site traffic by directing traffic to the best performing sites and links. Should one link become inaccessible due to a bottleneck or outage, the APV takes that link out of service, issues an alarm and/or sends email notification, and automatically directs network traffic to other functioning links. This process is virtually seamless to the user.

Infrastructure & WAN Cost Control

Costs associated with deploying, maintaining and supporting data center infrastructure can be significantly reduced by installing APV ADCs. Without this technology, Web and application servers can be overutilized to the point where they are unable to adequately handle traffic flows, or they can be underutilized. Furthermore, business-critical systems require ongoing maintenance, support and licensing costs, and they are a major contributor to data center energy costs. A key responsibility for the APV is to make underutilized servers more productive and take the load off of overburdened servers so they can handle more traffic.

Beyond production benefits, there is a huge opportunity for maximizing energy usage. When a server is idle, it can still consume 70% of the energy it uses when it is active. Often, hundreds of servers in data centers run at only 50%

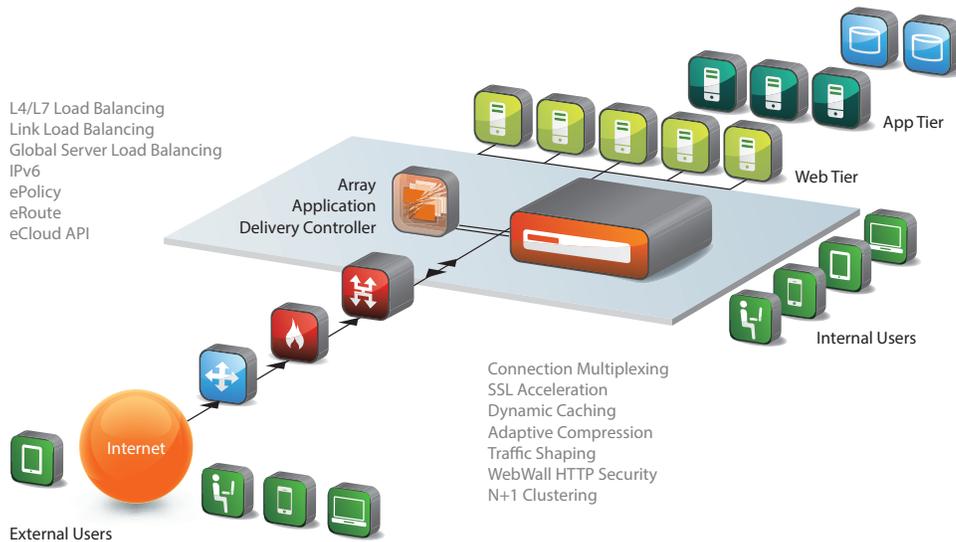


Figure 1: Typical APV Data Center Architecture

utilization; with APV, you can minimize energy costs in addition to increasing the overall data center reliability and performance by ensuring all resources are running in their power band. Additionally, APV ADCs reduce Web and application infrastructure complexity, which helps lower management, support and equipment costs.

The need for WAN link reliability is critical for remote employees and mobile workers as well as customers and partners. At the same time, businesses are looking for ways to lower costs for their WAN connectivity. It would seem that these two business imperatives are at odds, and in many respects they are. However, APV ADCs enable enterprises to replace expensive dedicated circuits with multiple lower-cost broadband connections (cable, DSL, wireless, etc). In addition to lowering monthly bandwidth costs, this approach gains vital WAN link redundancy and provides more bandwidth. Alternatively, if additional bandwidth is needed, rather than upgrading to more expensive dedicated circuits, enterprises can simply add a low-cost broadband connection because the APV is able to manage both the dedicated circuit and the broadband connection.

Because the APV handles TCP and HTTP handshakes locally, this traffic does not traverse the WAN and thus frees up network bandwidth to handle more traffic. In addition, caching and data compression remove nonessential and redundant data from going over the WAN to deliver more bandwidth savings to support more traffic.

Array APV Series Benefits

Over the years, Array Networks has led the way in consolidating point-level products into more robust application delivery solutions. APV is an application delivery controller that provides a single platform with integrated availability, acceleration, optimization and security capabilities dedicated to solving the most complicated application delivery issues.

At competitive price points and with the performance and features to meet the most stringent requirements, APV delivers industry-leading price-performance and value. Data centers reap the benefits of higher availability, improved performance, flexible scalability, optimized WAN links and secure application transmissions – all while lowering IT infrastructure costs. Key benefits of deploying Array to manage traffic between data centers and local and remote users include:

- Reduce server overhead by 40%
- Increase application performance by up to 10X
- Reduce network bandwidth utilization by 30%
- TCP connection multiplexing reduces server connections by 100X, reduces server requirements by up to 50% and improves response times by up to 5X
- Compression reduces network bandwidth by up to 50%, improves server throughput by up to 60% and improves end-user response times by up to 10X
- Caching improves response times by up to 10X, and increases server capacity by up to 50% without additional hardware
- Network and application security protects applications, servers and network resources
- Cost savings through the avoidance or postponement of server and bandwidth upgrades
- Faster response times and improved end-user productivity
- Flexibility to accelerate all enterprise applications
- Enable multiple areas of redundancy for reliability
- Avoid employee productivity losses due to slow server response times and network outages

Summary

Array APV products are a result of more than a decade of experience solving complex application delivery problems for Global 2000 companies. Array products are field-proven at the world's largest telecoms, financial institutions and Fortune 500 enterprises with 99.999% uptime. In addition to application availability, performance and security benefits, APV enables IT infrastructure to be consolidated and simplified, while reducing power and space costs. APV reduces server infrastructure requirements by up to 40%, reduces network bandwidth requirements by 30%, improves application performance by up to 10X and delivers a strong ROI in as little as 6 months.

About Array Networks

Array Networks, the network functions platform company, develops purpose-built systems for deploying virtual app delivery, networking and security functions with guaranteed performance. Headquartered in Silicon Valley, Array is poised to capitalize on explosive growth in the areas of virtualization, cloud and software-centric computing. Proven at over 5000 worldwide customer deployments, Array is recognized by leading analysts, enterprises, service providers and partners for next-generation technology that delivers agility at scale.



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