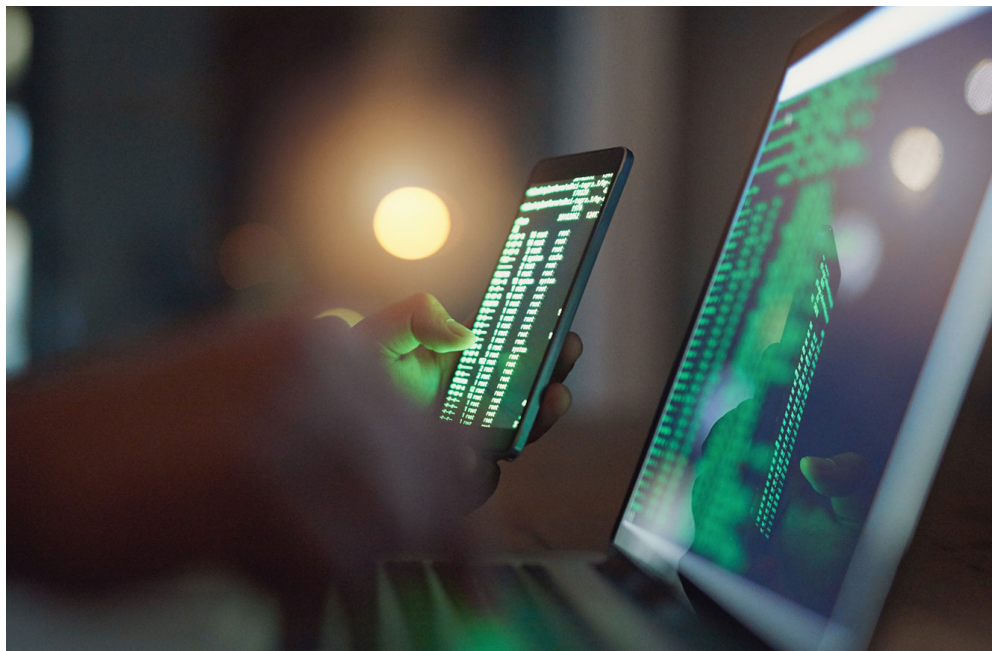# What You Should Know Before Choosing a Load Balancer

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Load balancing is a critical function for online organizations needing to cost-effectively scale their operations. This technology distributes traffic and application loads across multiple servers, while also ensuring business continuity via automatic failover processes.

Solutions are abundant, and evaluating which one best fits your infrastructure, availability, and growth requirements is no simple matter. Incapsula's new [How to Choose a Load Balancing Solution](#) guide helps you with this process. It addresses several key questions, including:

- What are the essential characteristics of today's load balancing technologies?
- What are the key criteria for selecting a load balancing solution?
- Which distribution methods are best suited for your IT environment?

- Which solutions offer cost-effective scalability, and at what trade-off degree?
- Which solutions are most compatible with hybrid or cloud environments?

Written by industry experts, Incapsula offers you the 18-page document as a free download, with the intention of helping you reach an effective data-driven purchase decision.

New Problem: The Abundance of Choice

The old school approach to load balancing mainly relied on [DNS-based solutions](#) that randomly distributed network traffic among data centers, as well as among servers within those centers (e.g., round robin DNS).

Well-funded organizations augmented their DNS solution by installing appliances to handle traffic distribution. While such hybrid setups were effective, managing them was complex from an integration standpoint. More importantly, these configurations were extremely costly, forcing developers to gravitate toward less reliable, DNS-only solutions.

With the evolution of cloud computing and platform as a service solutions, [load balancing](#) has evolved in tandem. You no longer have to compromise between overly simplistic and über-costly load distribution options. Instead, you're free to choose from an array of effective and progressively more-affordable technologies that open the market to enterprises of all sizes.

However, when faced with several good options, you still have to decide which one is best suited for your organization. With choices ranging from physical appliances like those from F5, to cloud-based services such as Incapsula, the answer is often unclear. Obviously, there is no one-size-fits-all solution. Still, diligent evaluation can lead you to the best solution for your environment.

Know Your Options

Understanding what each option offers is critical for deciding which load balancing technology to deploy. Incapsula's guide provides you with the pros and cons of the following options:

- **Traffic distribution methods and algorithms**: From static methods (e.g., [round robin](#)) typically used by DNS-based solutions and that rely on randomization, to dynamic and more advanced layer 7 methods which account for server status and are enabled by appliances or cloud services.
- **Deployment modes**: From a combination of DNS-based solutions and physical appliances, to virtual appliances running on off-the-shelf hardware or new load balancing as a service (LBaS) solutions located in the cloud.
- **Session persistence (stickiness)**: From active and server cookies, to more rudimentary network layer options relying on source IP address data.
- **Redundancy options**: From cable-based failover, to stateful failover and distributed failover with session persistence.

Gets Better With The Cloud

[Cloud-based load balancing](#) is a relatively new development, and is an attractive option for organizations interested in avoiding high capital outlays and ongoing scalability upgrades. This method is the best way to implement load balancing

across external cloud services.

For example, entities leasing software as a service offerings can use a cloud-based LBaS to act as an application delivery controller, thereby eliminating single points of failure by dynamically rerouting traffic around outages.

Other advantages include:

- **Layer 7 visibility**: Enables dynamic distribution algorithms based on the actual flow of traffic to each server, as well as cookie-based HTTP/HTTPS session stickiness.
- **High availability**: Offers failover support to distributed servers, while automatically rerouting traffic around outages, interruptions, and failed network connections.
- **Centralized control**: The management console is often integrated with other selected services, offering a unified view into the content delivery network.
- **Flexibility**: Cloud-based offerings provide elasticity and automated scale, where traffic loads can be monitored and additional resources accessed as needed.

Turning to the cloud for load balancing makes a lot of sense for enterprises running systems environments such as Amazon Web Services (AWS), Microsoft Azure, and VMware. It's also an effective strategy for organizations seeking to operate hybrid networksâ€"where a combination of cloud applications, internal/local applications, and multiple access sites are involved.

6 Key Considerations for a Data-Driven Decision

Based on our experience, Incapsula recommends the following best practices and key considerations for IT teams looking to select a load balancing solution:

1. **Identify immediate and long term needs**
   For many, deploying a load balancer is driven by traffic congestion, where growth has exceeded the capabilities of a given infrastructure. However, simply choosing a load balancer as a way to equally distribute traffic across a server farm is very short-sighted. You should also consider how the network should be distributed, what level of failover is required, whether you need encryption, as well as the security implications of building a server cluster.

2. **Calculate anticipated loads**

   In many cases, an organization selects a load balancing solution to meet its current traffic growth. However, many either overspend on hardware (and services) that isn't needed, or under-buy, creating a situation where they quickly outgrow their chosen solution. To avoid such common pitfalls, you should identify the underlying factor behind traffic growth (e.g., seasonal peak, new service, merger) and plan accordingly.

3. **High availability (HA)**

   Although a load balancing solution may be chosen to reduce server utilization and maximize traffic flow, IT departments should not ignore the importance of business continuity. This can mean the difference between a profitable business and a failed one. Online organizations should always make HA a priority when choosing a load balancing solution.

4. **Security concerns**

   Introducing load balancing into your network environment typically means that more traffic is being handled and more application servers are being used in the data center. This equates to attackers having more targets. Security should be an integral component of your business growth strategy.

5. **Return on Investment**

   Calculating the ROI for any piece of IT hardware, software, and ancillary services can be a complex accounting exercise. With load balancers, however, the calculation is simply a matter of comparing the cost of lost business against what a load balancing solution brings to the table. For example, downtime can be calculated and used as a metric to compare against load balancing deployment costs.

6. **Total cost of ownership**

   Calculating an accurate TCO estimate facilitates the budgeting process, especially when evaluating the perceived value offered by any one solution. Decision makers should calculate not only the initial deployment costs, but also ongoing expenditures, such as service contracts and software upgrades.

Bottom Line

Choosing a load balancing platform can be a complex endeavor requiring an in-depth understanding of your enterprise infrastructure for content and application delivery. The process is further complicated by the wide variety of available options. The key is to choose a solution only after fully considering the implications of future growth and scalability in relation to performance, availability, and security.

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