

## Foundry ServerIron Firewall Load Balancing Switch

Enterprises and e-commerce businesses must scale their networks to keep pace with exploding networking traffic. At the same time, they need to keep their networks secure making it essential to deploy firewalls. Since all the traffic between the Internet and Intranet goes through the firewall, the firewalls must scale up to handle increasing network traffic along with other components in the network. In addition, mission-critical networks must be designed for reliability to ensure that the firewall is not a single point of failure for the whole network. It is important to note that firewall downtime may be scheduled or unscheduled- such as a scheduled maintenance time or unexpected failure in the firewall hardware or software.

Firewalls are limited in performance on two fronts- the number of connections, and amount of throughput. Number of connections is an indicator of how many users will be accessing the network. Each user typically uses multiple TCP connections and each one of those connections consumes certain resources on the firewall. Once the users establish connections, they exchange data with servers in the Intranet, and this represents the throughput that a firewall must be able to handle.

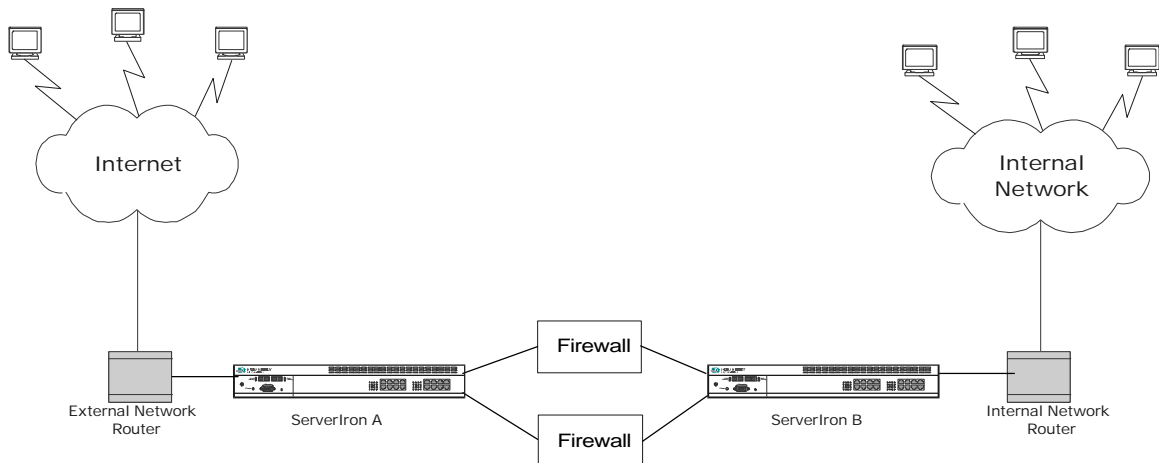
Multiple firewalls can be deployed for scalability and reliability- but the trick is in balancing the traffic on inbound and outbound across these firewalls, and ensuring that users are not affected when a firewall fails or is down for maintenance. Firewalls could be symmetric or asymmetric: Symmetric firewalls share connection information between each other so the data for a given connection can go through any firewall. Asymmetric firewalls do not share connection information and traffic must be revalidated each time it goes through a new firewall.

### Firewall Load Balancing requirements

- Scale beyond capacity of one firewall
- Ensure firewall is not a single point of failure in the network
- Easy to configure and manage multiple firewalls

## Solution 1: Firewall Sandwich

*Designed for Ironclad performance*



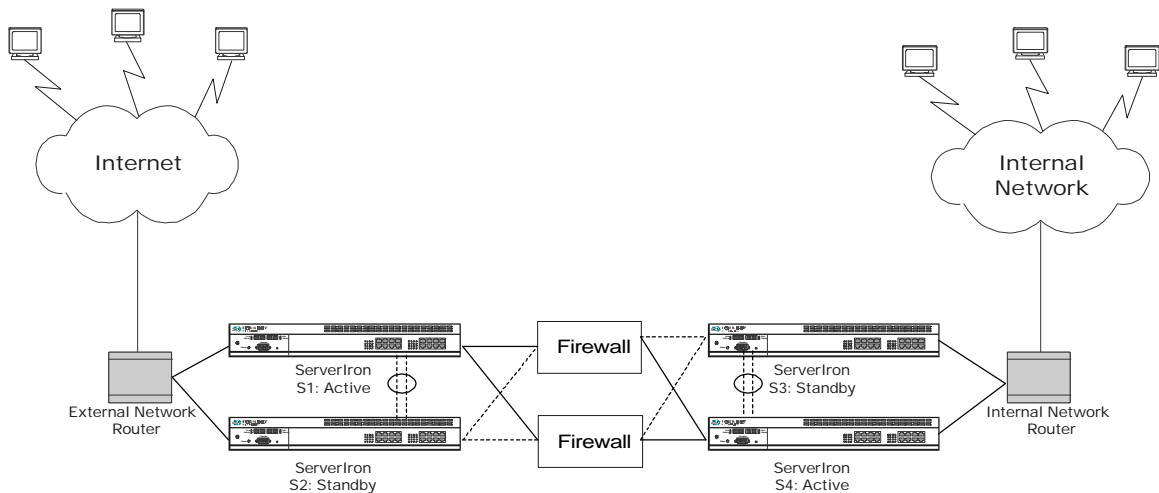
In the simplest scenario, a ServerIron 8/16/24 port switch can be used to connect firewalls both on the inbound and outbound for load balancing. The ServerIron's 8, 16 or 24 10/100 ports can be used to connect to the firewalls, while 1 or 2 Gigabit ports can be used to connect to the router. Multiple 10/100 links can be trunked to get more aggregate point-to-point throughput. ServerIron active

ServerIron uses sophisticated load distribution algorithms to distribute the traffic among firewalls for maximum scalability. ServerIron will perform extensive health checks on not just the firewalls, but also the links that connect the firewall to the network. Should a firewall fail or be taken down for maintenance, ServerIron will transparently switch over the traffic to another one.

If the firewalls are asymmetric- i.e. do not share connection information among themselves, ServerIron can transparently ensure that all the traffic for a connection will always go through the same firewall. This feature will help minimize the overhead on firewall synchronization even if the firewalls were symmetric.

## Solution 2: Firewall Sandwich with fault-tolerance

*Designed for Ironclad performance and fault-tolerance*



Two ServerIron 8/16/24 port switches can be used on both sides of the firewalls in active-standby configuration. In this configuration, one of the ServerIrons on each side of the firewalls will act as the active, and service all the requests. The stand-by ServerIron will synchronize by listening to the connection information received from the active ServerIron and be ready to take over should the active fail or be taken down for maintenance. The fail-over is completely transparent to the network users and will not cause session loss.

### Multiple levels of fault-tolerance

When deployed in Active-Standby mode, ServerIrons will do periodic health checks (twice every second) to monitor the status of each other. The ServerIrons S1 and S2 can be connected over a trunk group consisting of two physical links for fault-tolerance. For added safety, ServerIrons can also use the data paths to do health checks should the private link completely fail. In this example, ServerIrons provide multiple levels of redundancy:

- ❑ Service level: If a firewall fails or is taken down for maintenance, traffic will transparently be switched to another firewall.
- ❑ Session level: ServerIron is stateful and will maintain session.
- ❑ Switch level: If a ServerIron fails or is taken down for maintenance, the other ServerIron will transparently take over.
- ❑ Link Level: If one of the physical links connecting to the firewall or the ServerIrons, an alternate link or firewall will be used.

## ***ServerIron at a glance***

Foundry's ServerIron load balancing switch delivers exceptional performance in a dense form factor. It provides 8, 16 or 24 10/100 ports and up to two Gigabit fiber ports. ServerIron delivers up to 800 Mbps of throughput, and handles over 1,000,000 concurrent sessions. ServerIron delivers blazing performance because it builds layer 4-7 capabilities over the 4.2 GBPS of raw layer 2 switching using Foundry's custom ASIC design. Optional redundant power supply and support for hot standby makes ServerIron an essential component for fault-tolerant, high performance networks.

## **High Port Density, Cost Effective Solution**

ServerIron provides 8, 16 or 24 10/100 ports, and up two Gigabit fiber ports, the highest port density available in its class. ServerIron is a very cost-effective solution for firewall load balancing- for example, to load balance eight firewalls in fault-tolerant network design, each load balancer will need eleven ports. Customers can save on external additional layer 2 switches because ServerIron provides up to 24 10/100 ports.

## **No per-port limitations**

ServerIron is built on a central processor and shared memory architecture that enables to take advantage of ServerIron capacity whether you use 2 ports or 24 ports, and imposes no limits per port. The ASIC and backbone technology is same as the high-performance Layer 2 switches from Foundry.

## **Layer 4-7 capabilities, simplicity of Layer 2 Switching**

ServerIron delivers rich load balancing features with the simplicity of Layer 2 switching. Because ServerIron is not a router, it saves users the unnecessary complexity of configuring and managing routers. However, ServerIron is layer-3 capable to understand routing protocols such as RP, OSPF, BGR, and IGRP and responds when appropriate to support fail-over when deployed in active-standby or active-active configurations.