ANALYSIS OF LOAD BALANCING CLUSTER COMPUTING PERFORMANCE ON PROXMOX VE

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Motivation

This research aims to examine the performance of load balancing on a cluster. Load balancing is a solution for large access load and   minimizes downtime in serving requests from users. Load balancing distributes loads of traffic evenly to servers with particular algorithms.

Our Works

Scenario 1

Implemented using Linux Virtual Server (LVS) topology via direct routing on Proxmox VE and use round-robin algorithm for load balancing

Scenario 2

Performed to find out the number of requests per second and packet loss with load of 250, 500, and 1000 users as many as 3 times for 1 minute between single server with load balancing on   cluster computing.

Scenario 3

Intends to prove that the failover on load balancing can manage to requests copying of the   process and configuration from Master to Backup with an average value of downtime.

Topology
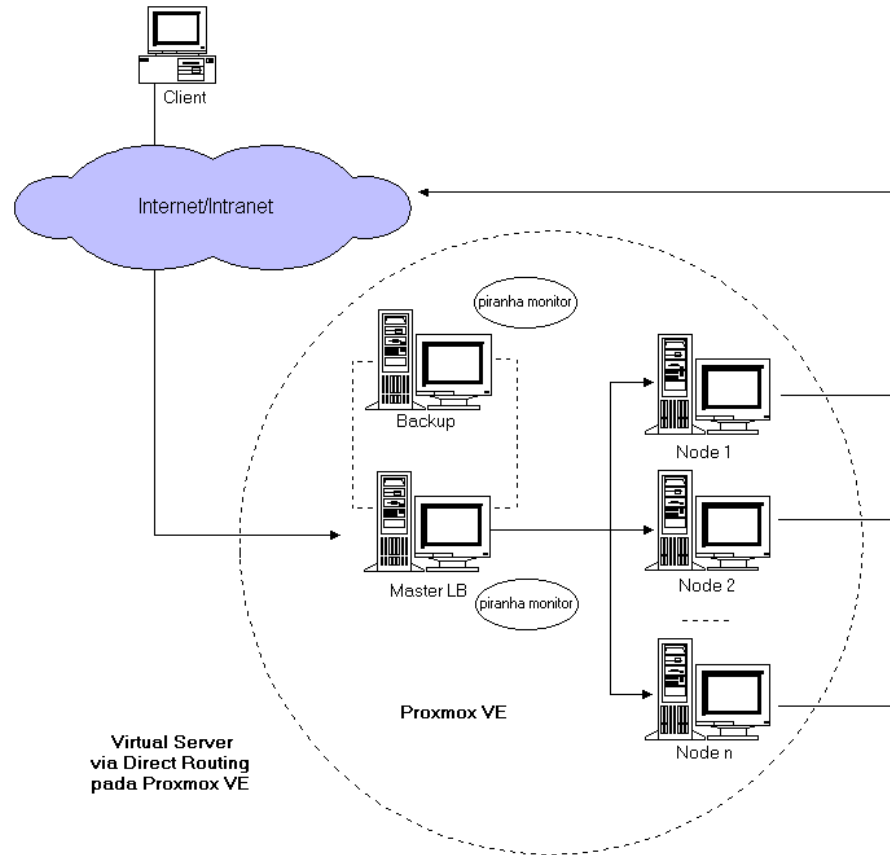
Hardware & Software

Host

CPU Octa Core @ 2.5 GHz
Memory 4 GB DDR3
Storage 300 GB (IDE)
Operating System Proxmox VE 4.1
Network Adapter 1 : Custom (PCnet –FAST III)

CPU Single Core @ 2.5 GHz
Memory 500 MB DDR3
Storage 50 GB (Local-LVM)
Operating System CentOS 6.0 Final (i386-mi
nimal)
Network Adapter 1-4 : Bridge (vmbr)
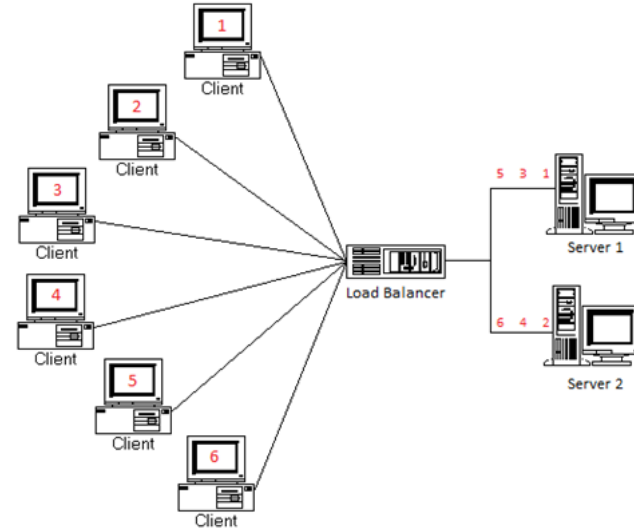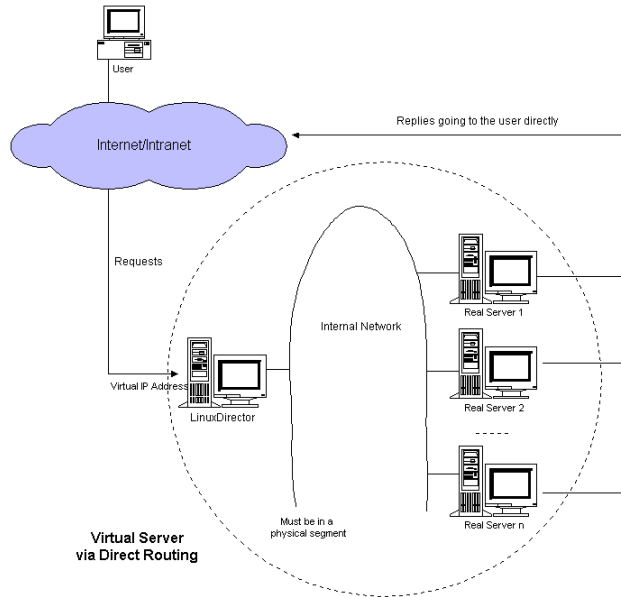Ipvsadm (Piranha)
LAMP (Linux-Apache-MySQL-PHP)

Guest

User

CPU Octa Core @ 1.9 GHz
Memory 8 GB DDR3
Storage 500 GB
Operating System Windows 10
Network Adapter : VB Ethernet Adapte
r
WebServer Stress Tool 8
Net Uptime Monitor

Conclusion

Scenario 1

Implemented using Linux Virtual Server (LVS) topology via direct routing on Proxmox VE and use round-robin algorithm for load balancing

Conclusion
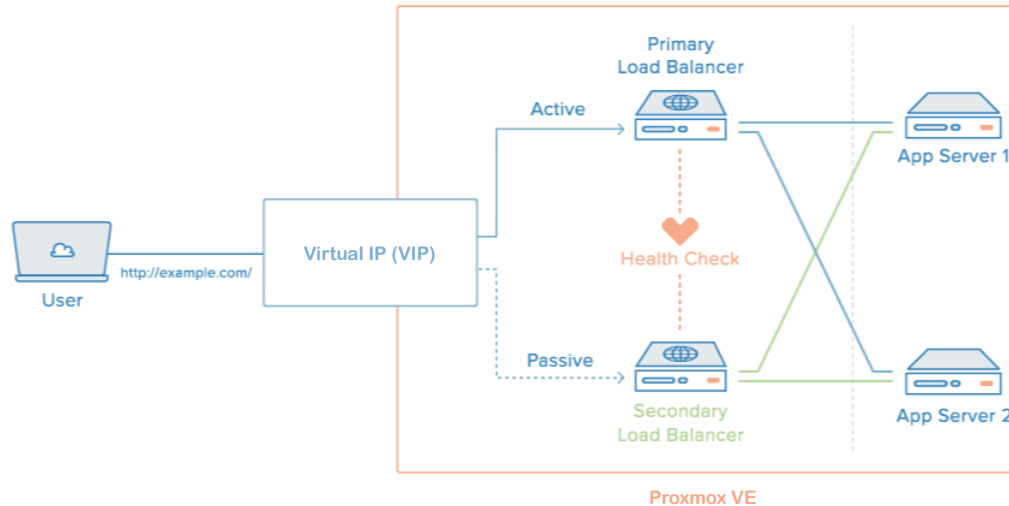
Scenario 1

Implemented using Linux Virtual Server (LVS) topology via direct routing on Proxmox VE and use round-robin algorithm for load balancing
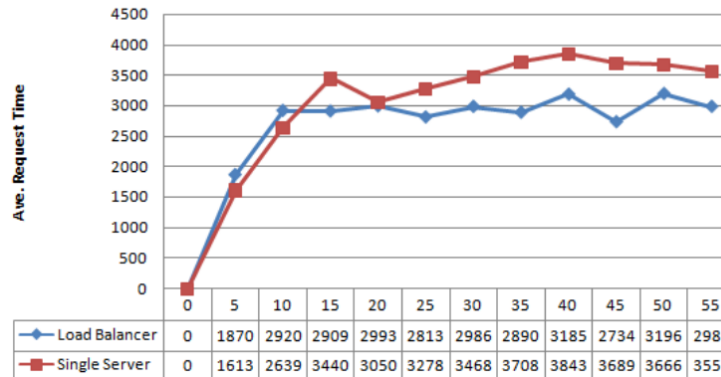
Conclusion

Scenario 2

Performed to find out the number of requests time and packet loss with load of 250, 500, and 1000 users as many as 3 times for 1 minute between single server with load balancing on cluster computing.

Request 250 User

	0	5	10	15	20	25	30	35	40	45	50	55
Load Balancer	0	1870	2920	2909	2993	2813	2986	2890	3185	2734	3196	2986
Single Server	0	1613	2639	3440	3050	3278	3468	3708	3843	3689	3666	3554

Name	Clicks	Errors	Errors [%]	Time Spent [ms]	Avg. Click Time [ms]
Load Balancer	4,291	0	**0.00**	12,325,289	**2,872**
Single Server	3,941	36	**0.91**	12,792,645	**3,276**

Conclusion

Scenario 2

Performed to find out the number of requests time and packet loss with load of 250,   500, and 1000 users as many as 3 times for 1 minute between single server with load   balancing on cluster computing.
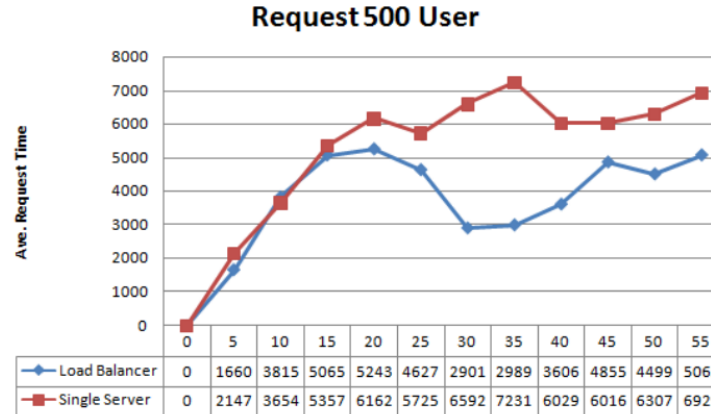
Request 500 User

	0	5	10	15	20	25	30	35	40	45	50	55
Load Balancer	0	1660	3815	5065	5243	4627	2901	2989	3606	4855	4499	5065
Single Server	0	2147	3654	5357	6162	5725	6592	7231	6029	6016	6307	6929

Name	Clicks	Errors	Errors [%]	Time Spent [ms]	Avg. Click Time [ms]
Load Balancer	3,784	0	**0.00**	15,220,957	**4,022**
Single Server	3,594	239	**6.65**	19,424,124	**5,790**

Conclusion

Scenario 2

Performed to find out the number of requests time and packet loss with load of 250,   500, and 1000 users as many as 3 times for 1 minute between single server with load   balancing on cluster computing.
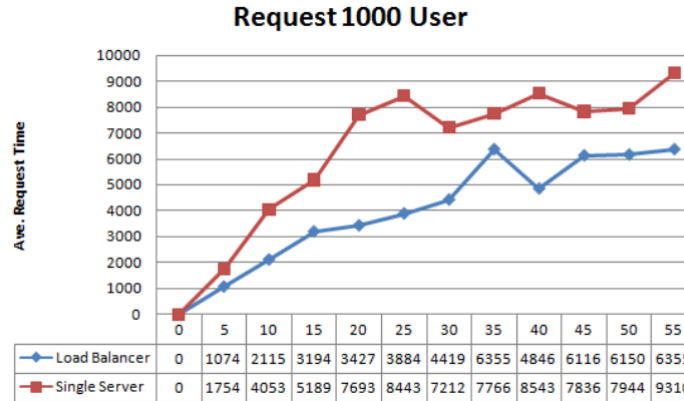
Request 1000 User

	0	5	10	15	20	25	30	35	40	45	50	55
Load Balancer	0	1074	2115	3194	3427	3884	4419	6355	4846	6116	6150	6355
Single Server	0	1754	4053	5189	7693	8443	7212	7766	8543	7836	7944	9310

Name	Clicks	Errors	Errors [%]	Time Spent [ms]	Avg. Click Time [ms]
Load Balancer	3,395	0	**0.00**	14,138,671	**4,165**
Single Server	3,934	884	**22.47**	22,170,186	**7,269**

Conclusion

Scenario 3

Intends to prove that the failover on load balancing can manage to requests copying of the   process and configuration from Master to Backup with an average value of downtime.

Failover	Downtime
1	16 s
2	17 s
3	17 s
4	19 s
5	16 s
6	13 s
7	18 s
8	19 s
9	17 s
10	14 s

Thank You