Concepts

Terminal System: Server-based computing is a system architecture in which Microsoft Windows client applications are fully installed and performed on the server. Not only their management is effected from there, but also their maintenance, administration, and support take place directly on the server.
Session, means Terminal Session in this article.
Client, means the workstation with monitor and keyboard, it will connect to terminal server
User, means the operator with terminal client.

What is MrBalance, and why you need it

It is usually for set many server for terminal service, to reduce server loading and avoid the risk from crash, and keep them security is a other important task.
MrBalance is a powerful helper for terminal cluster, it can help you to reach to this targets.

What it can help for you

It is our direction to help user to use their servers more effective and safe. Though MrBalance, you can:

1. More easy to setup server cluster. No complexity for load balancing again.
2. Make server cluster works under suitable load, so terminal users can get a good experience for operation.
3. Easily to expand you cluster dynamically.
4. Improve cluster's security. "Front Solution" can separate the servers to avoid attack.
5. Improve strong for network switches, it isn't set necessary to change any switch setting, and avoid data-storm that cause by NLB.

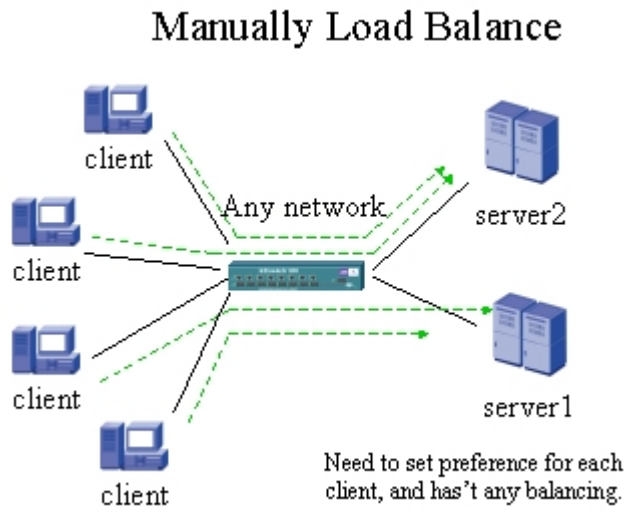
MrBalance Components

MrBalance have two components, called "Agent" and "Balance".
MrBalance-Agent collect the performance information, and re-pack terminal service as a service provider.
MrBalance-Balance accept the client's connection, and select the suitable server to connect, make load balancing between servers though smart computing.

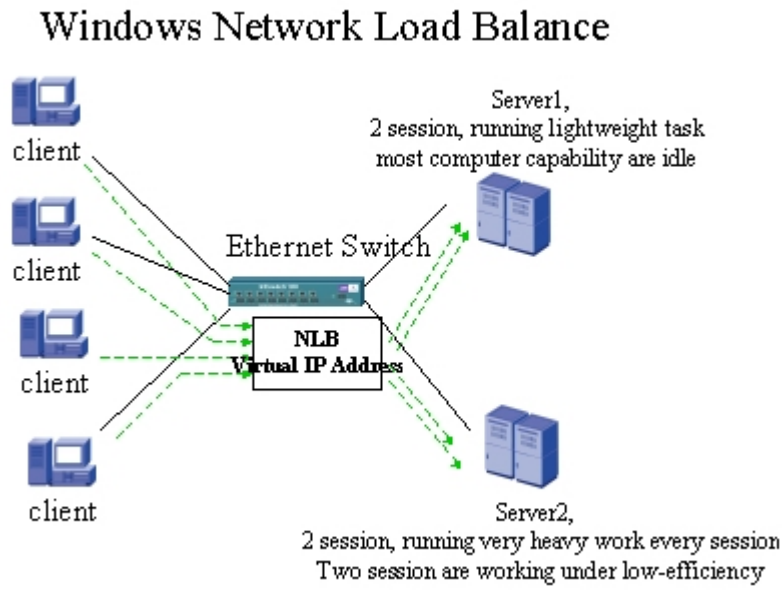
How it do that

More easy to setup server cluster

In large application, it need many terminal service to service many user, there are some way to load balance:
1.set each client preference manually, special which server should be connect to each client



but when a server crash, the relative client need to reconfigure again, it is very trouble. because it isn't dynamic, so when server#2 's client disconnect all, the server#2 is idle, but not serve for other clients.
2.Using the network flow balance component to implement the balancing for network connections



But it can't implement the real load balance, because it don't known which session is heavy, or light.
3.Using professional software for exact load balancing, MrBalance is one of good choice.

Make servers cluster running high effective is important, it keep your invest.
The terminal server is expensive, special for graphic terminal server. When exist many server, people don't want one of the server running hardly (terminal user has a awful experience), but the others are idle at the same time.

Windows 2003 server provide Network Load Balance function, for this function, NLB can try to give client connect request to each server roundly. But server can't known which session(Connection) is valid or heavy. It will cause a server running a heavy session (task), other server running two light session(task), when new connect coming, NLB give it to the first server, but not the seconds server.

NLB just can implement in a Ethernet LAN, try to work when exist many subnet, VLAN, kinds of heterogeneous network is difficult.

MrBalance base on IP protocol, can suitable for any network structure. MrBalance will compute load of server (refer to CPU load, memory load, terminal session count), it can keep servers in cluster get relative balance task, so it can let each session can running with enough server's power.
For create cluster by MrBalance, just make client can connect to balancer host, and balance service can connect the agent host. whatever the physical network or switch levels or VLAN setting. let you manage it easily.

In other way, administrator can install MrBalance balancer on their computer, it can use to monitor server status (CPU load, memory load, session, session user), let you manage it easily.

Real-time load balancing

Implement smart balancing is a target for most clusters. Though MrBalance, cluster can keep good load balancing automatically. MrBalance compute and forecast the load of each server dynamic. When server out of control, it will limit the affection to other clients. For example, a terminal session crash, the application running by session cause CPU load up to 100%, MrBalance will warn, and refuse to create new session for this server (at this time, new client request will be redirect to other server).
MrBalance will monitor the CPU continuously, avoid the CPU snap peak value.
Follow is the server configuration for test.

Server Number	CPU	Memory	
#11			Just install RDP Balancer for monitor
#12	Xeon 3Ghz	1GB	RDP Balancer+Agent
#13	Xeon 2Ghz	3GB	RDP Balancer+Agent
#14	PentiumM 1.5	512MB	RDP Balancer+Agent
#15	CeleronM 1.5	512MB	RDP Balancer+Agent
#16	Xeon 2Ghz *2	2GB	RDP Balancer+Agent
#17	AMD 2Ghz *2	1GB	RDP Balancer+Agent (Active Directory)

All server has 120GB scsi disk, and server #12-#17 grouped as NLB.

MrBalance can keep good balance effective when large login as same time.

Send 187 session login request in 10 seconds.		
Server Number	**Memory Load**	**Sessions**
#12	85%	32
#13	32%	41
#14	97%	19
#15	116%	22
#16	44%	42
#17	86%	31
All Session Count		187

Send 49 session login request again in 10 seconds.			
Server Number	**Memory Load**	**Sessions**	**+Sessions**
#12	101%	40	8
#13	40%	54	13
#14	109%	22	3
#15	124%	24	2
#16	58%	56	14
#17	104%	40	9
All Session Count		236	49

Easily to expand you cluster dynamically

When the clients want to expand their cluster, they will has two doubt:
1.To import the new server, it need to change NLB setting, or third-party components. for high security level enterprise usage, it need to change the switch configuration too.
2.The new server capacity will more powerful than old the servers, if using NLB for balance, it will cause the new server does not have enough task, but the old servers still have too many tasks. it don't make the best of new servers.
Using MrBalance, you just add the new server agent to exist MrBalance balancer's agent list, not any modification for network switch. And MrBalance provide smart balancing, let your new server "forwardly" to accept enough tasks, and reduce load of old servers.

Improve cluster’s security

It can split terminal servers cluster from out-side environment though put the balance service as foreside. Give a server that have two NIC, and enable MrBalance balancer service on it. Then enabled MrBalance agent on back group-side terminal clusters, When clients connect to balancer, and balancer connect to terminal servers. In this mode, balancer acts as bridge (or gateway).
We can setup a few balancer too, and group them with NLB to create a redundancy, safe firewall.
Outside network just can see the balancer, but can’t attack the terminal servers. It refuse not-licensed user to access terminal service so it can increase the security.

Detail for “Solution III”.

Reduce data storm in your network

Most cluster using NLB for balancing, there are two kinds of mode.
When using multicast, it require to change switch VLAN setting for new server. When using unicast, it require two NIC on your server.
In other ways, when cluster grow enough, the communication with NLB will cause a large data-storm, because all data are broadcast to each NLB member actually. It can be solved by MrBalance, for example as 30 servers in cluster, we can group 5 server to NLB, and keep them to same network switch. All clients connect to these five server's (virtual ip), them re-direct to 30 terminal service later, the data-storm has been control in a switch.

Detail feature

MrBalance features:
Software-based solution, to save money to hardware, and free modifications to network too.
Good compatibility, support Windows 2000 Server, Windows 2003 Server. And can support ICA later.
Compatible with Windows 2003 firewall, no more setting for this.
Provide real-time load balancing, avoid many session live in several servers(it will make server running slowly, and waste of other server's capacity).
Flexible setting, can reference to terminal server's "session count", "CPU load", "memory load" while balancing.
Support two balance method, "Resource Based" and "Round Robin".
Support any network architecture, don't restrict by network structure.
Support reconnect to disconnected session.
Support many balancer to connect many agent(crossing).
Administrator can monitor servers performance, and check for yellow light to know if a problem in system.
Compatible with Windows NLB, can combine it as redundancy terminal cluster solution.
"Front Solution" to improve server's security.
While serve with many servers(more than 20), it can avoid data-storm than pure NLB solution.
Not limited server node in cluster (NLB restricted with 32).