

Load Balancing Windows Terminal Server with Session Directory Using Array APV Series ADCs



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1 Introduction

Terminal Services is a technology that enables users to run applications on a remote Windows Server 2003 or 2008-based computer. In a terminal server-based computing environment, all application execution and data processing occurs on the server. In a load-balanced environment, a farm of terminal servers has incoming session connections distributed in a balanced manner across the servers in the farm. Terminal Services Session Directory maintains a list of sessions that are indexed by user name, and allows a user to reconnect to the terminal server where their disconnected session resides and to resume that session.

1.1 Connecting to a Terminal Server Farm

When a user authenticates with a terminal server in the farm, the terminal server queries the Session Directory database with the user name. If a session with the same user name exists on one of the terminal servers in the farm, Session Directory will instruct the initial server, upon which user has landed, to redirect the user to actual server where the user session still exists.

This enables a user to disconnect a session with applications running, whether intentionally or because of a network failure, and then reconnect at a later time to the same session, with the same applications running.

2 Array APV Integration

Array APV Series application delivery controllers provide session persistence by load-balancing terminal session traffic across a terminal server farm using Terminal Services Session Directory Service (TSDS). This enables a user to disconnect a session with applications running, whether intentionally or because of a network failure, and then reconnect at a later time to the same session, with the same application.

Terminal Services Session Directory Service is a database that keeps track of sessions on terminal servers in a load-balanced farm. The database maintains a list of the user names that are associated with the session IDs that are connected to the servers in a load-balanced terminal server farm. It can either reside on a server that is separate from the terminal servers in the farm, or be hosted on a member of the terminal server farm.

2.1 Scenario 1: Real Server IP Addresses are Visible to Clients

If the real terminal server IP address is visible to the client, the client data stream is redirected from a virtual IP address to a specific real server.

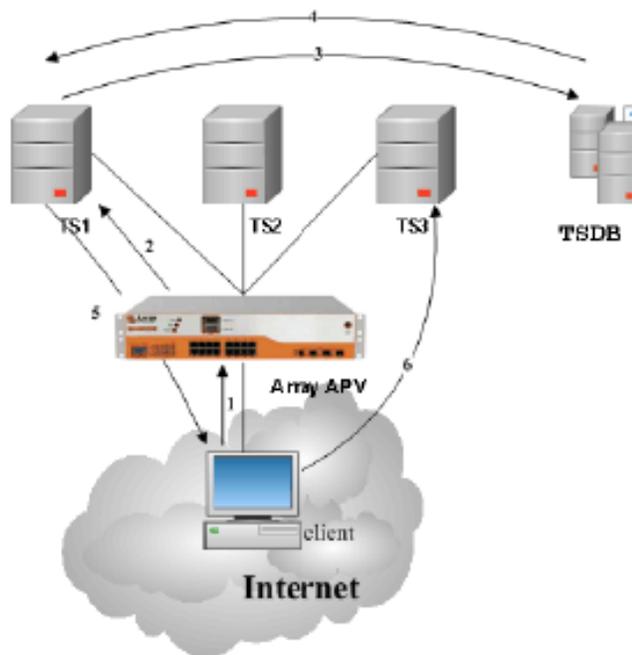


Figure 1: Scenario 1 Process Flows

The process flows in this scenario (see Figure 1) are as follows:

1. A client connects to a virtual IP address.
2. The APV Series redirects the client connection to a specific real terminal server, for example TS1.

3. The client receives the logon screen and the user enters a user name and password. The TS1 server validates the user name and password, and then queries the Session Directory server TSDS with the user name.
4. TSDS identifies that the user name is associated with a session already active on TS3, and passes this information to TS1.
5. TS1 passes the encrypted authentication information to the client. The load-balancing packet contains the IP address of TS3 that the client will use to connect to TS3 directly.
6. TS3 performs a look-up on the user name against the disconnected sessions that are running on the server. TS3 then reconnects the user to the disconnected session that is associated with the user name.

2.2 Scenario 2: Real Server IP Addresses Are Not Visible to Clients

When terminal server IP addresses are not visible to clients, the Session Directory will pass a routing token to the client with logon information and the correct server IP address embedded and encrypted, and the client presents this routing token to the APV Series. The APV Series then deciphers the token and sends the client to the correct terminal server, together with the logon credentials.

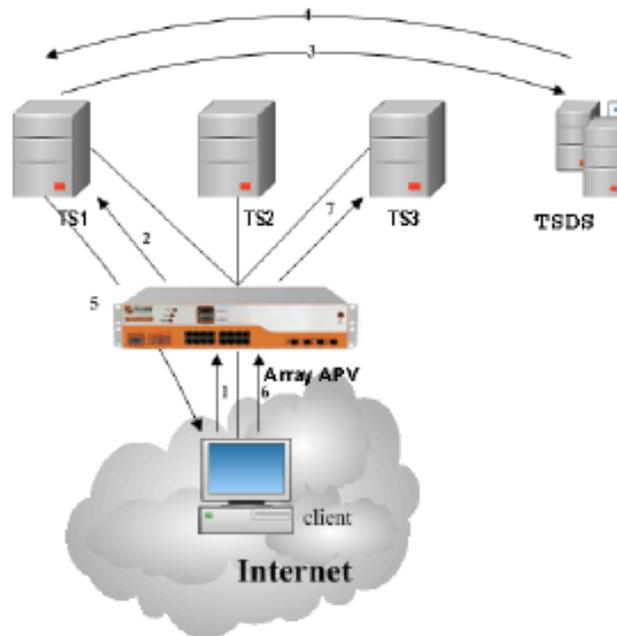


Figure 2: Scenario 2 Process Flows

The process flows in this scenario (see Figure 2) are as follows:

1. A client connects to a virtual IP address.
2. The APV Series redirects the client connection to a specific real terminal server, for example TS1.

3. The client receives the logon screen and the user enters a user name and password. The TS1 server validates the user name and password, and then queries the Session Directory server TSDS with the user name.
4. TSDS identifies that the user name is associated with a session on TS3, and passes this information to TS1.
5. The server tells the client computer to reconnect to the same cluster IP address as it did initially, but it also tells the client to send a "routing token" at a certain offset in its first packet sent to the server. TS1 then drops the connection with the client.
6. The client connects to the same virtual IP, and this time it provides the routing token.
7. The APV Series looks at this routing token, which contains information about the IP address and port number to which to redirect the client (which are the correct IP address and port number for TS3), sets up the correct internal mapping, and the user successfully logs on to their existing session on TS3.

2.3 APV Series Configuration Commands

ArrayOS APV 8.x and TM 6.x have a Remote Desktop Protocol application proxy built-in to support RDP client-server session persistency. By using the built-in proxy, no special or custom rule needs to be developed.

Following are the SLB CLI commands that are used for basic RDP processing.

slb real rdp <real_name> <ip> [port] [maxconn] [tcp|icmp] [hc_up] [hc_down]

This command is used to create an RDP real service. The default port number for RDP is 3389.

slb virtual rdp <virtual_name> <ip> [port] [arp|noarp] [maxconn]

This command allows users to create a RDP virtual service. The default port number for RDP is 3389.

slb group method <name> rdprt [rr|sr|lc]

This command creates an rdprt group with the given group name. The [rr|sr|lc] argument can be called the "first choice method," and it defaults to rr.

2.4 APV Series Configuration Samples

2.4.1 Sample 1

```
slb real rdp "rdp_rs1" 172.16.69.190 3389 1000 icmp 3 3
slb real rdp "rdp_rs2" 172.16.69.190 3389 1000 icmp 3 3
slb group method "rdp_group" rdprt rr
slb group member "rdp_group" "rdp_rs1"
slb group member "rdp_group" "rdp_rs2"
slb virtual rdp "rdp_vs1" 172.16.69.171 3389 arp 0
slb policy default "rdp_vs1" "rdp_group"
```

2.4.2 Sample 2

```
slb real rdp "rdp_rs1" 172.16.69.190 3389 1000 icmp 3 3
slb real rdp "rdp_rs2" 172.16.69.190 3389 1000 icmp 3 3
slb group method "rdp_group" rdprt lc
slb group member "rdp_group" "rdp_rs1"
slb group member "rdp_group" "rdp_rs2"
slb virtual rdp "rdp_vs1" 172.16.69.171 3389 arp 0
slb policy default "rdp_vs1" "rdp_group"
```

2.4.3 Sample 3

```
slb real rdp "rdp_rs1" 172.16.69.190 3389 1000 icmp 3 3
slb real rdp "rdp_rs2" 172.16.69.190 3389 1000 icmp 3 3
slb group method "rdp_group" rdprt sr
slb group member "rdp_group" "rdp_rs1"
slb group member "rdp_group" "rdp_rs2"
slb virtual rdp "rdp_vs1" 172.16.69.171 3389 arp 0
slb policy default "rdp_vs1" "rdp_group"
```

2.5 Summary

Array APV Series application delivery controllers provide session persistence by load-balancing terminal session traffic across the terminal server farm using Terminal Services Session Directory Service (TSDS). This persistence enables a user to disconnect a from session, even with applications running, then reconnect at a later time to the same session, with the same application(s) in the same state as they were when the previous session ended.

About Array Networks

Array Networks is a global leader in application delivery networking with over 5000 worldwide customer deployments. Powered by award-winning SpeedCore software, Array application delivery, WAN optimization and secure access solutions are recognized by leading enterprise, service provider and public sector organizations for unmatched performance and total value of ownership. Array is headquartered in Silicon Valley, is backed by over 300 employees worldwide and is a profitable company with strong investors, management and revenue growth. Poised to capitalize on explosive growth in the areas of mobile and cloud computing, analysts and thought leaders including Deloitte, IDC and Frost & Sullivan have recognized Array Networks for its technical innovation, operational excellence and market opportunity.



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