Propalms TSE
Capacity Planning &
Server Sizing
Version 6.0 / 6.5 / 7.0

Propalms Ltd.
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TSE Roles

Minimum 2 GB RAM and 1.4GHz CPU

Primary Database Server: Windows server running dedicated SQL 2005 (x32, x64 and Express) or higher.

Backup Database server: Can be run on a shared SQL server on the network.

Same as for Native Remote Desktop Services.

Minimum 2GB RAM and 1.4 GHz CPU

Propalms uses Microsoft Remote Desktop Protocol as its core delivery protocol and the Remote Desktop Session Host (Terminal Server) to run the applications. Hence the scaling and sizing requirement for TSE Application server roles is exactly the same as it is for native remote desktop services.

Propalms TSE Application role is the only role that requires higher resources as it will host user’s remote desktop sessions running the published app. The other Propalms TSE roles do not need higher resources and work efficiently on any modest hardware server specification.

An administrator can install the Propalms TSE Web and Load-Balancer roles on TSE App servers but it is recommended to have them on separate servers.
Propalms TSE Team Recommendation

Web Role:
One server is mandatory but for redundancy and load sharing TSE WEB role should be deployed on at least 2 servers. The primary web server should be a dedicated web server but can also run the LB role due to the close relationship between these 2 TSE roles. The 2nd web server role can be installed along with the secondary load balancer servers.

*Note that HTTP connections are not persistent connections, the connection is stateless and per instance.*

With a dual core processor, it should be able to handle and serve up to 200-300 simultaneous logon connections. So at peak login time, depending on how many users connect to the web server at the same instance, will determine the CPU requirement of the web server. On an average per core can handle 100-150 connections. It can handle more but performance will degrade with the number of concurrent connections going up.

There should be another server running the WEB role with similar hardware specification. This 2nd Web server will serve as a fall back secondary web server should the client fail to communicate with the primary web server. TSE internally also distributes the http download requests for TSE App icons and client install files to the other WEB servers available in the TSE team.

Load Balancer (LB):
One is mandatory and for redundancy it should be installed on at least 2 servers in total.

The primary load balancer can be a dedicated server however we recommend in most cases that the LB role be deployed on the same server as the TSE web role. The LB role does not have heavy resource requirements therefore a primary LB server specification should be similar to the primary web server. Note that clients never make a direct connection with the LB server. LB server communicates with WEB and APP servers using RPC.

Application Role:
Two or more servers depending on the number of applications and users required.

On a general note, TSE APP server hardware sizing requirement is similar to that of Microsoft Remote Desktop Services. But as MS recommends, it’s a function of the application being published through TS and kind of resources made available within the session. So a true test is monitoring and recording server resource usage with each user session, running the published app. This will be the most correct method for sizing server specs for publishing user apps.

How many concurrent Remote Desktop Sessions can run on a single Windows Remote Desktop Server?
Answer:
Generally anywhere between 5 and 100+, depending on the following factors:

- Speed, type and number of CPUs installed on the terminal server.
- Amount of RAM installed in the remote desktop server.
- Client settings, i.e. local resource redirection, screen resolution & color depth.
- Other services running on the server, i.e. Active Directory, Exchange, SQL... (NOT recommended).
- Bandwidth available for Remote Desktop sessions (a main consideration for WAN connections).
- End-user applications being used in each session, i.e. Microsoft Office, Acrobat Reader, Internet Explorer...
Here are Microsoft’s general recommendations and suggestions for sizing and scaling Remote Desktop Servers.

**NOTE:** This is just a reference guide. Propalms do not guarantee server sizing as the actual sizing of servers depends on the applications and resources made available to users within their Propalms Session.

**RDS Host recommendations (taken from TechNet):**

**Estimated 150 sessions per host**
- Windows Server OS x64
- 10 CPU cores (vCPUs)
- 24-32GB RAM

**General guidelines:**
- 2GB RAM is the optimum limit for each core of a CPU. For example, if you have 4 GB RAM then for optimum performance there should be Dual core CPU.
- 2 Dual Core CPU perform better than single Quad core processor.
- On a RDS session host 64 MB per user is the base memory (RAM) requirement + 2 GB for OS. For example, (100 users * 64) + 2000 = 8.4 GB i.e. 8GB RAM. Each application will then add more memory per user which will need to be added to the calculation.
- 15 RDS sessions per CPU core is the optimum performance limit.
- 64kbps is the ideal bandwidth per user session. See bandwidth calculations at the end of this document for more information.
- RDS performance is significantly enhanced when running x64 hardware and OS.
- Remember that enabling Desktop Composition will have a significant impact on resource usage and will affect server capacity negatively.
- When running RD Session Host servers in a virtualized environment, make sure the processor supports paging at the hardware level (RVI for AMD, EPT for Intel).

For more information you can download the Remote Desktop Session Host Capacity Planning document from Microsoft.


**What do the terms "Scale-up" and "Scale-out" mean?**

**Answer:**
- Scale-up means to add more resources to a server (i.e. additional CPUs or RAM) to be able to host more remote desktop services sessions.
- Scale-out means to add more server nodes to a remote desktop services environment to be able to host more remote desktop services sessions.

It is generally recommended to ‘scale out’ where feasible as this minimizes the impact on users of a hardware / operating system failure and can increase the performance across a team of RDS servers.

**Which operating system should I use for Remote Desktop Server?**

**Answer:**
The most efficient operating system for Remote Desktop Services is Windows 2012 Server. Windows Server 2012 is 64bit only therefore you need to make sure your applications can run effectively in this environment before making a decision. TSE is backwards compatible so you can run TSE APP servers on windows operating systems such as Windows 2003 or 2008 if your applications require it.
Is there a program that will help me to choose the correct number and size of servers to host different software and a specified number of sessions?

Answer:

The Remote Desktop Load Simulation toolset is used for server capacity planning and performance/scalability analysis.


In a server-based computing environment, all application execution and data processing occur on the server. Therefore it is extremely interesting to test the scalability and capacity of servers to determine how many client sessions a server can typically support under a variety of different scenarios. One of the most reliable ways to find out the number or users a server can support for a particular scenario is to log on a large number of users on the server simultaneously. The Remote Desktop Load Simulation tools provide the functionality which makes it possible to generate the required user load on the server.

Band Width Calculation for User session through Propalms

Propalms uses the RDP protocol to deliver user sessions. The actual bandwidth used for each session can change significantly due to application type, user type, local device redirection etc.

There are various articles on Microsoft discussing the RDP bandwidth requirements. The following document details findings from Microsoft:


You can also use tools such as Network Monitor and set it up to capture RDP traffic for analysis.

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