

Terminal Server

Software and Hardware Requirements

Datacolor Match Pigment
Datacolor Tools

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Terminal Server – Software and Hardware

Introduction

This document will provide preliminary information about the both the software and hardware requirements for running Datacolor Match Pigment and Datacolor Tools in a Terminal Server environment.

The information in this document should be use as a guide and any final design considerations should be addressed with your IT Department and Datacolor Applications.

Windows Server Terminal Services

The Terminal Services server role in Windows Server® 2016 provides technologies that enable users to access Windows-based programs that are installed on a terminal server, or to access the full Windows desktop. With Terminal Services, users can access a terminal server from within a corporate network or from the Internet.

Terminal Services lets you efficiently deploy and maintain software in an enterprise environment. You can easily deploy programs from a central location. Because you install the programs on the terminal server and not on the client computer, programs are easier to upgrade and to maintain.

When a user accesses a program on a terminal server, the program execution occurs on the server. Only keyboard, mouse, and display information is transmitted over the network. Each user sees only their individual session. The session is managed transparently by the server operating system and is independent of any other client session.

A standard Windows server allows multiple users to simultaneously connect to resources (files, printers, and services) but only one user can be interactively logged onto the server console at a time. With Terminal Services in Windows Server® 2016, multiple users can connect and run interactive sessions on the server, independent of what any other user is doing.

With Terminal Services, users can connect to “virtual” desktops on the server. Datacolor Match Pigment and Datacolor Tools are executed on the server instead of on the client device and the virtual desktop is transmitted across the network to the client device. Each user can execute and run their own instances of the software on the server, independent of what any other user is doing.

Datacolor Software

In order to properly run in a multi-user environment such as Terminal Server, application programs must be able to handle global, user, and machine based data and setup information properly. This is handled in Datacolor Spectrum products by implementation of a directory structure that will manage system data and setup information based on whether it is global for all users, pertinent to a single user, or valid only for a local machine.

New shared software components have been written to create folders in specific locations and the Datacolor Spectrum programs have been modified to save and retrieve specific data from these locations.

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Server Software Requirements

Compatible Operating Systems

Windows Server 2016 and Windows Server 2022

Standard, Enterprise, Datacenter Editions

Datacolor software is designed to work in a terminal services environment. We have not installed or tested on all of the possible editions of Windows Server software and Citrix software. Please contact Datacolor prior to installing software.

64 Bit Operating Systems

Datacolor software is targeted for 32 bit processors. It can run on a 64 bit operating system in 32 bit capability mode.

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Server Hardware Requirements

It's impossible to make general recommendations on hardware without knowing the scope and purpose of a particular application. The information below should only be used as a guide in determining the optimum hardware. The hardware requirements for Windows Server Terminal Services depend mainly on how many clients will be connecting at a time and the type of programs run by the clients.

The quality of the hardware for a terminal server installation is the most important criteria concerning the performance of the overall system. Since the server must run all the applications of the connected clients, it must be quite powerful. The final server configuration is a balance of price, manageability, and application requirements.

The first rule in selecting hardware is to select "real" server hardware. A regular desktop computer that is similar in speed and memory to a true server will not perform as well. Low-end PCs typically do not have the internal bus speed and internal bandwidth to support many users regardless of the processor and memory.

It is recommended that you install Terminal Services on a member server and not on a domain controller. Installing Terminal Services on a domain controller can hamper the performance of the server because of the additional memory, network traffic, and processor time that it requires to perform the tasks of a domain controller in a domain.

Server Processor

Determining a recommended processor without knowing the number of users and the applications that will be run is impossible. Combinatorial matching will put the greatest burden on the CPU. The practical limit will be the number of simultaneous users that will perform combinatorial matching. For the processor, get at least:

Windows Server® 2016 – 2 GHz (x64) or faster

Server RAM & CPU Cores

The amount of RAM and CPU Cores required will depend on the number of concurrent users. The chart below gives estimated minimum memory requirements. This can be used as a rough guide for determining memory requirements.

- a) Application Server & Database Server on same system- Windows Server 2016

		Total Number of Users								
		2	4	6	8	10	12	14	25	50
App Servers	1	10 GB	10 GB	12 GB	12 GB	16 GB	16 GB	18 GB	N/A	N/A
	2	10 GB	10 GB	10 GB	10 GB	12 GB	12 GB	12 GB	18 GB	26 GB
	3	N/A	10 GB	10 GB	10 GB	10 GB	10 GB	12 GB	12 GB	18 GB

- b) Application Server & Database Server on separate systems - Windows Server 2016

		Total Number of Users								
		2	4	6	8	10	12	14	25	50
Apps Servers	1	8 GB	8 GB	10 GB	10 GB	14 GB	14 GB	16 GB	N/A	N/A
	2	8GB	8 GB	8 GB	8 GB	10 GB	10 GB	12 GB	16 GB	24 GB
	3	N/A	8GB	8 GB	8 GB	8 GB	8 GB	12 GB	10 GB	16 GB
Sybase Server										10 GB

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c) Application Server – CPU Cores

	Total Number of Users									
		2	4	6	8	10	12	14	25	50
App Servers	1	2	4	6	6	8	8	10	N/A	N/A
	2	2	2	4	6	6	6	6	10	12
	3	N/A	2	4	6	6	6	6	6	10

Notes:

- Citrix consumes more RAM than RDS

Program Memory Requirements

The final memory requirement will be dependent on the number of users and their applications. Every user that runs an application on a Terminal Server will use the memory for that application just as if they were running it in a normal workstation. The following table will show the approximate memory usage of some Datacolor programs.

Application Program Memory Requirements (Per User)

Program	Minimum RAM	Maximum RAM
Data Navigator	40 MB	50 MB
Datacolor Tools	100 MB	150 MB**
Formula Central	50 MB	75 MB*
Data Navigator Datacolor Tools	140 MB	200 MB
Data Navigator Formula Central	90 MB	125 MB
Data Navigator Datacolor Tools Formula Central	190 MB	275 MB
Datacolor Track	50 MB	50 MB
Datacolor Envision	26 MB	190 MB **

* 25 MB Additional Required for Combinatorial Matching

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** Depends on the size of images in the environment:
Load a 5MB environment ~35MB memory use per user
Load a 15MB environment ~55MB memory use per user
Load a 25MB environment ~65MB memory use per user
Load a 105MB environment ~190MB memory use per user

Note: minimum requirements for installing Windows Server® 2016

- Processor: Minimum 1.4 GHz 64-bit Processor
- RAM: Minimum 512 MB
- Disk Space: Minimum 32 GB
- Network: Gigabit (10/100/1000baseT) Ethernet adapter, 1Gbps Connection is ideal

Hard Drive Requirements

Disk speed is critical for the performance of a Terminal Server. For highest disk performance, consider using a SCSI redundant array of independent disks (RAID) controller. RAID controllers automatically place data on multiple disks to increase disk performance and improve data reliability. A SCSI Solid State Drive SSD is recommended for maximum performance..

Minimum Hard Drive: 500 GB

The application can generate up to 100 back-end IOPS per concurrent user during certain operations

Example:

8 concurrent users
 $100 \text{ IOPS} * 8 = 800 \text{ IOPS}$

Use 5 x 15k RPM disks (FC or SAS, 180 IOPS/disk) in a RAID5 configuration

Network Adapter

A high-performance network adapter is recommended, especially if users require access to data that is stored on network servers or run client/server applications. Using multiple adapters can significantly increase network throughput. Consider having two network adapters in the server machine and designate one for RDP traffic only.

Single Embedded 10/100/1000 Gigabit NIC

Network Latency & Bandwidth

Network latency will primarily impact remote desktop user's perception of performance primarily through potentially slow screen I/O refresh, but it will generally not impact the actual time to perform certain operations.

The following network latencies have been tested with minimal impact on the end user RDP performance:

- 4ms (approx. 50 miles): relative RDP screen I/O performance = 100%
- 100ms (approx. 50 miles): relative RDP screen I/O performance = 90%
- 260ms (approx. 50 miles): relative RDP screen I/O performance = 60%

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Example: high network latency will not impact combinatorial matching with Match Pigment, but will impact large data transfers, such as printing back through the RDP client (bandwidth will also significantly impact performance in this example).

- Smaller data transfers - such as a typical measurement operation, send approximately 200 packets and 30k of data (combined measurement traffic and RDP traffic during a measurement period). The relatively small number of packets and data transferred during this operation is less affected by latency and bandwidth.
- Larger data transfers – such as printing back through the RDP client to a locally attached or mapped printer can transfer approximately 2000 packets and 500k of data.

Client Software and Hardware Requirements

Client computers that connect to a Terminal server are not required to have much processing power. Therefore, it is very easy to integrate Terminal Services into a network that has older computers and equipment.

The basic precondition for using a specific client computer is the integration of monitor, mouse, keyboard, and serial ports as well as the support of the RDP protocol.

In principle, the potential client platforms can be divided into:

- Personal computers under Windows 10
- Windows-based terminals
- Apple Macintosh computers

Currently only PCs running under the following Windows operating system have been tested and are supported by Datacolor:

Microsoft Windows 10

* While Microsoft generally supports multiple platforms for use in a terminal server environment, these platforms have not been tested by Datacolor and therefore cannot be supported.

Client computers must have a serial port or USB port for instrument connection.

Database Server Hardware Requirements (Optional configuration)

Server Processor

- Processor: Minimum 4 Core
- RAM: 16 GB
- HD: 1 TB (SSD Optimal)