

# Terminal Server Services Pattern

v1.0

## Status of this Memo

This memo provides information for the NIH architecture community. This memo does not specify an NIH architecture standard of any kind. Distribution of this memo is unlimited.

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## 1. Introduction

The purpose of this NRFC is to provide a means by which Division of Extramural Activities Support (DEAS) staff can access electronic file storage areas controlled by one or more ICs while the personnel are physically located in another IC and are connected to the NIHNet via the "home" IC's LAN. This NRFC also provides for the access to applications residing on external IC's LANs.

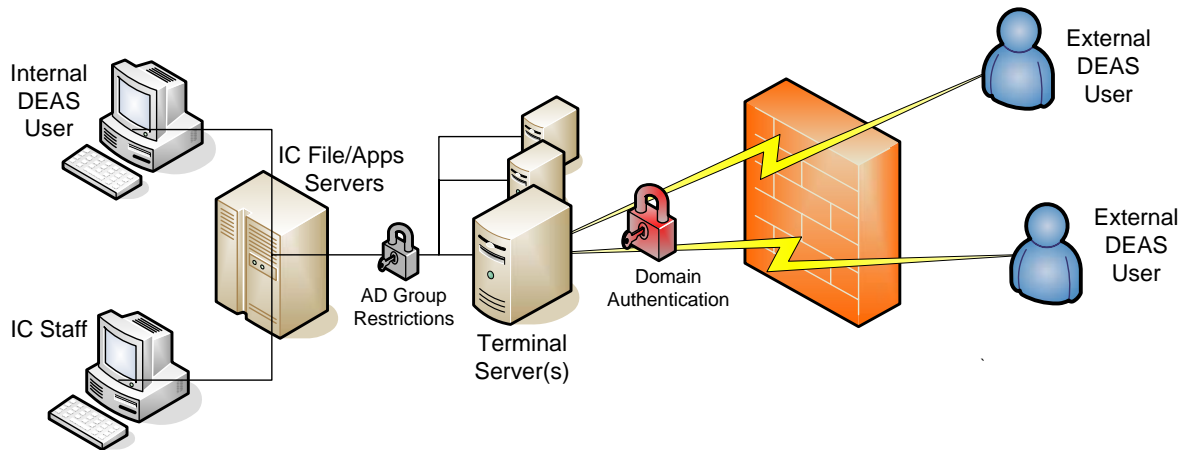
## 2. Description

Microsoft (MS) Windows Terminal Services (terminal server) provide the ability for clients, in this case the DEAS staff, to log on securely to an IC's network from an outlying location through resources that are not managed by the IC. The terminal server is located on the remote IC's network, behind any firewalls run by the remote IC. DEAS staff working outside the IC for whom the work is being performed use their existing workstation to log on to terminal server services which will allow access to files and applications securely, as if this person's PC were directly on the remote IC's local network. All application execution and data processing occur on the terminal server, and only keyboard, mouse and display information is transmitted over the network.

Each DEAS staff member sees only his or her individual session, and their session is independent of any other client session. Desktop configurations on the terminal server are distinct from those on the client computer and can be standardized across all users of the terminal server. Therefore, potential issues introduced by variations in IC user PC configuration, capability and hardware can be eliminated as the same applications will run regardless of the diverse classes of desktop hardware and operating system levels used by the various ICs.

Permission to log onto the terminal server is granted via domain authentication. Trusts currently exist between the NIH parent domain and all child domains. Once connected to the terminal server, access to remote IC files and applications is granted via MS Active Directory® groups.

## 2.1. Diagram



**Figure 1: Terminal Server Pattern Diagram**

## 2.2. Benefits

- Provides a solution for both file sharing and application execution.
- As application execution and data processing occur on the terminal server, incompatibilities among applications and drive mappings across ICs are eliminated.
- Requires minimal configuration and administration of client computer by IT staff where DEAS staff members reside. Personnel can access terminal servers through desktop icons, and servers can be configured to allow access via Web browsers.
- Allows presentation of a standard interface to all clients.
- Potential complexity introduced by variations in local IC PC hardware configurations can be eliminated.
- Allows file and application access by Macintosh computers.
- Allows rapid, centralized deployment of applications, requiring only a single installation of an application regardless of the number of users.
- Considerably reduces the amount of network bandwidth required to access data and applications remotely.
- This design is scalable and robust. If multiple terminal servers are required, MS Terminal Server services allows for load balancing across the servers. MS terminal server services also allow for failover to secondary servers.
- As MS Terminal Server licenses are covered under the current NIH-Microsoft licensing agreement, additional Terminal Server licenses will not be required.

## 2.3. Limitations

- Each IC will need to provide terminal server hardware (\$2,000 - \$6,000).
- Requires personnel resources at remote IC for deployment, monitoring, maintenance, and modification (~0.05 FTE).
- Each IC may need to purchase additional licenses for software run through terminal server services.

- Each IC will need to create and manage terminal server accounts/profiles for each user. Accounts will be managed via MS Active Directory groups.
- There could be a learning curve associated with using a remote desktop, and with how the terminal client interacts with local computer activities such as printing and saving files on the client computer.
- Cannot run DOS programs.
- Having many clients connected at the same time could result in degradation of server performance, particularly if video-intensive programs or programs with continuous background activity (e.g., Word spell check) are running.
- If an IC is not currently running a terminal server, and if the IC has a firewall rule set that is more restrictive than the current NIH rule set, the IC may need to adjust firewall settings (i.e., open port 3389) to accommodate incoming and outgoing terminal server sessions.

## 2.4 Screenshots



Figure 2: Remote Desktop Connection Application

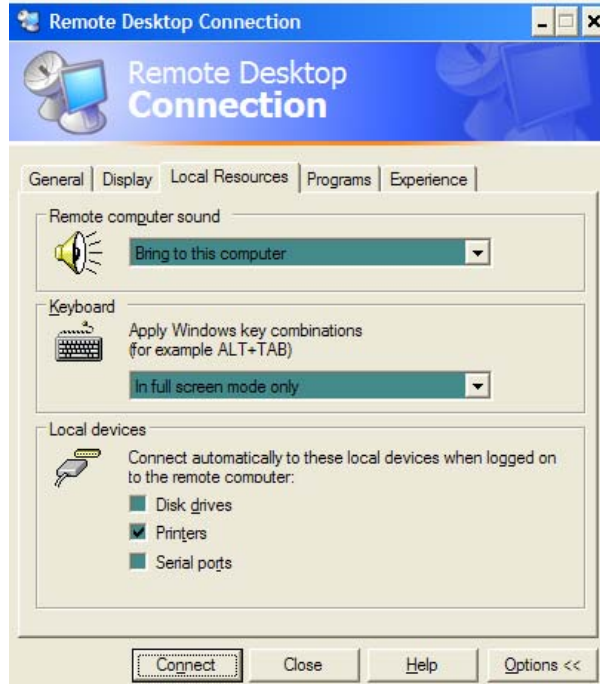


Figure 3: Remote Desktop Connection Local Resources Options

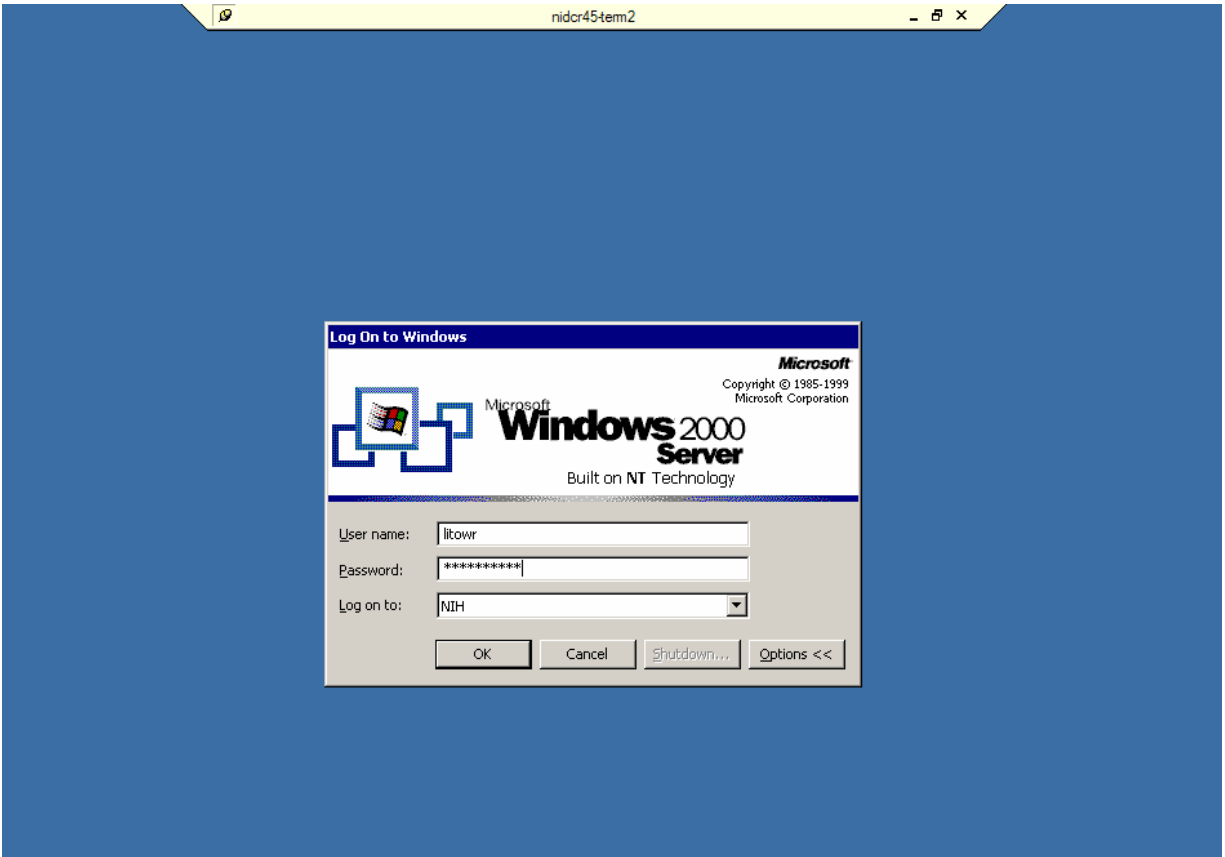


Figure 4: Logging On to Terminal Server using Domain Authentication

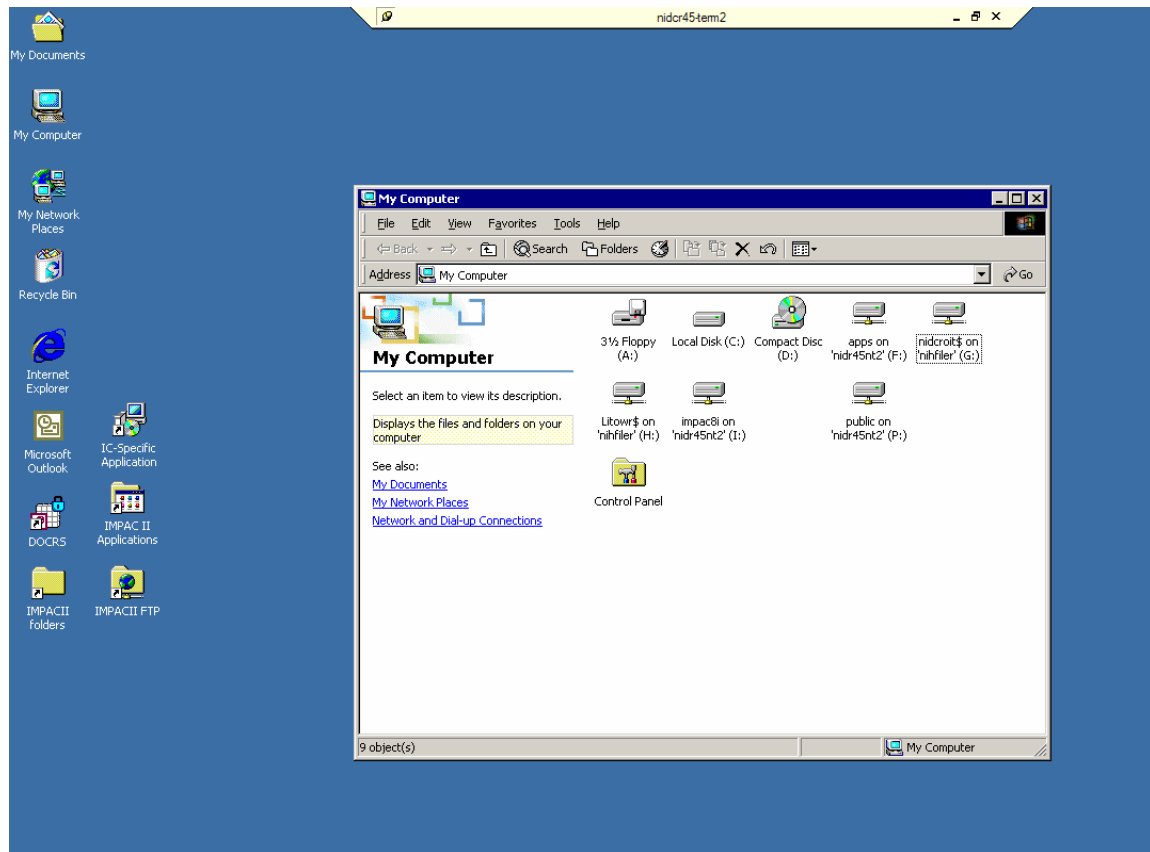


Figure 5: Terminal Server Desktop

### 3. References

Microsoft Corporation. (2005). *Technical Overview of Windows Server 2003 Terminal Services*. <http://www.microsoft.com/windowsserver2003/techno/overview/termserv.mspx> (24 Oct. 2005).

### 4. Contact

To contact the NRFC Editor, send an email message to [litow@nih.gov](mailto:litow@nih.gov).

### 5. Security Considerations

This NRFC raises no security issues.

## 6. Changes

Version	Change	Authority	Author of Change
0.0	Original Template		Roger Litow
0.1	Changed pattern diagram, added screen shots of terminal server access, and incorporated changes discussed in pattern review meeting on December 9, 2005	Roger Litow	Roger Litow
0.2	Style and format corrections; applied correct header and NRFC number.	NRFC0001	Steve Thornton, NRFC Editor
1.0	Applied version number and date.	NRFC0001	Steve Thornton, NRFC Editor

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