

# White Paper: Service Dependencies in Microsoft<sup>®</sup> Windows NT/2000/XP/Server 2003 Servers

*Rev 2 – June 1, 2006*

Lieberman Software Corporation  
<http://www.liebsoft.com>

---

## **Abstract**

This white paper demonstrates how to the intricacies of service dependencies – and a simplified way to change them with Lieberman Software's **Service Account Manager™**.

## Contents

1. Background	3
2. Dependencies – Changing a Service When Other Services Depend on it	4
3. Using Service Account Manager	5
4. Summary	5

## 1. Background

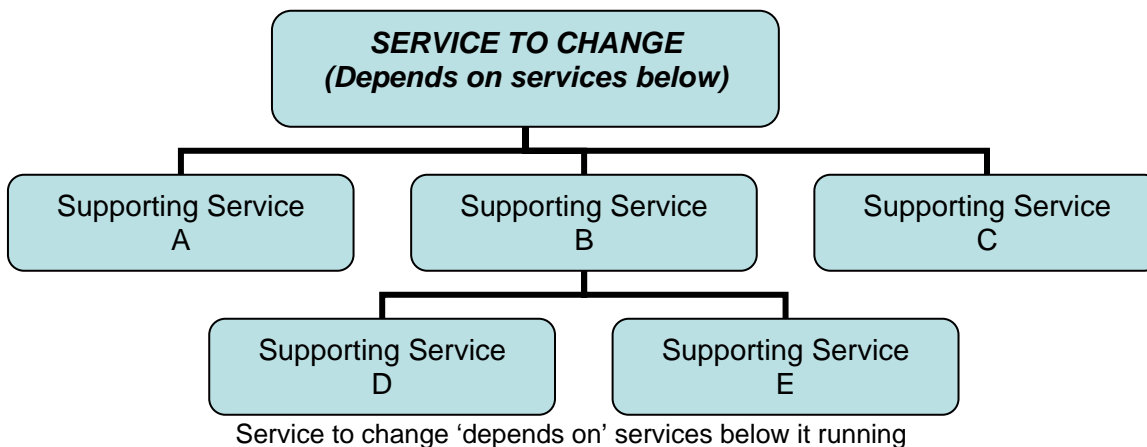
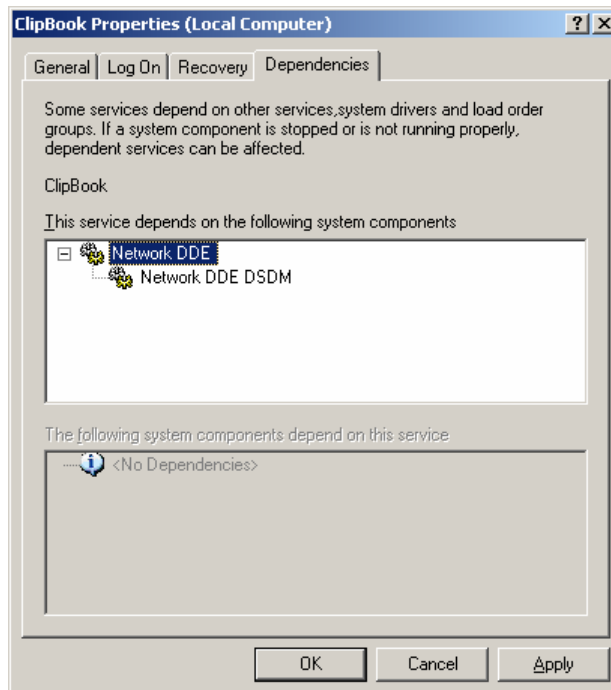
Dependency issues can be the hardest things about changing services. When trying to change the settings of complex service based programs like Veritas BackupExec and Microsoft Exchange, administrators are usually frustrated when they attempt to change any of the service settings using the tools provided by Microsoft in the operating system or by the most basic third party service management tools.

In this article you will learn the basics of how service dependencies work and how to properly handle services with complex dependency relationships.

There are two types of dependencies: services that a service depends on before it can start, and service(s) that depend on the service. The screen shot first shows the services that the ClipBook service depends on (Network DDE and Network DDE DSDM). The second window in the screen shows that no service depends on the ClipBook service.

In this case, we stop the ClipBook service whenever we want since nothing depends on the service. We can start the ClipBook service as long as the Network DDE and Network DDE DSDM services are running or can be started on demand.

To understand how dependencies affect service start/stops, imagine a service is a floor you are standing on within a tall building. You depend on the floors beneath you to be there before you can walk on the floor (these would be the services, or floors, you “depend on” or your foundation). You can change settings (start service) of your services as desired as long as the supporting services are running or can be started. Before you can remove a floor, all of the floors above it must first be removed. This last case is equivalent to stopping a service while other services depend on the current service.

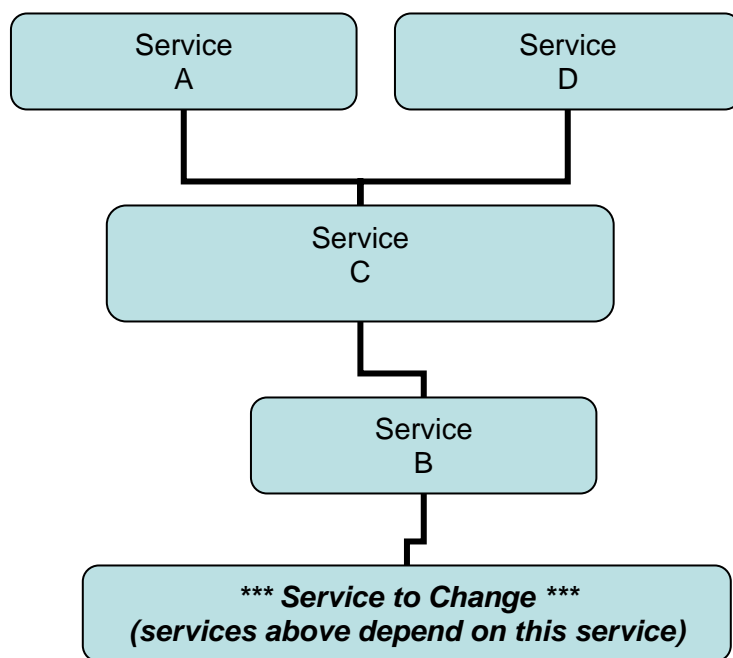


## 2. Dependencies – Changing a Service Where Other Services Depend on It

When managing complex service based applications such as Veritas BackupExec and Microsoft Exchange, you may have been frustrated by your inability to stop the services as well as being unable to change the account used by these applications.

The reason for your frustration was due to the complex interlocked relationship between all of the services in these applications. Simple service management tools such as those provided by Microsoft in the operating system are not capable of disentangling the complex service relationships and fail. Only the manufacturer supplied tools generally do the job correctly (and then sometimes even these tools do not work). In the worst case, some applications require the complete reinstallation of an application to change the service account.

With the exception of Microsoft's SNA server, we have not encountered any services that absolutely require the reinstallation of an application to change a service account. In our opinion, this implementation in SNA Server appears to be a fundamental security design error in the application that needs to be corrected. Consider if you have a distributed organization with hundreds of copies of SNA Server, your administrator leaves, and you now need to reinstall SNA Server on all systems with a new account. Imagine!



Disentangling the interlocking relationships of services can be done by examining the hierarchical relationships between all services, dynamically building a linear dependency list, stopping all services above the current service, stopping the current service, changing the current service, starting the current service, and restarting all of the services in the just built linear dependency list. Using this technique, even the most complex service can be managed with ease. In some cases additional dependency ordering may be needed, so any tool for service management should provide both dynamic and manual specification of dependent service stop/starts.

**Tip!** Microsoft's own management tool for services makes no attempt to resolve dependency issues. Make sure that any third party management solution for services is capable of handling these complex dependency relationships. If you have no other choice, you can change your service accounts without stopping and starting services and just restart the machine.

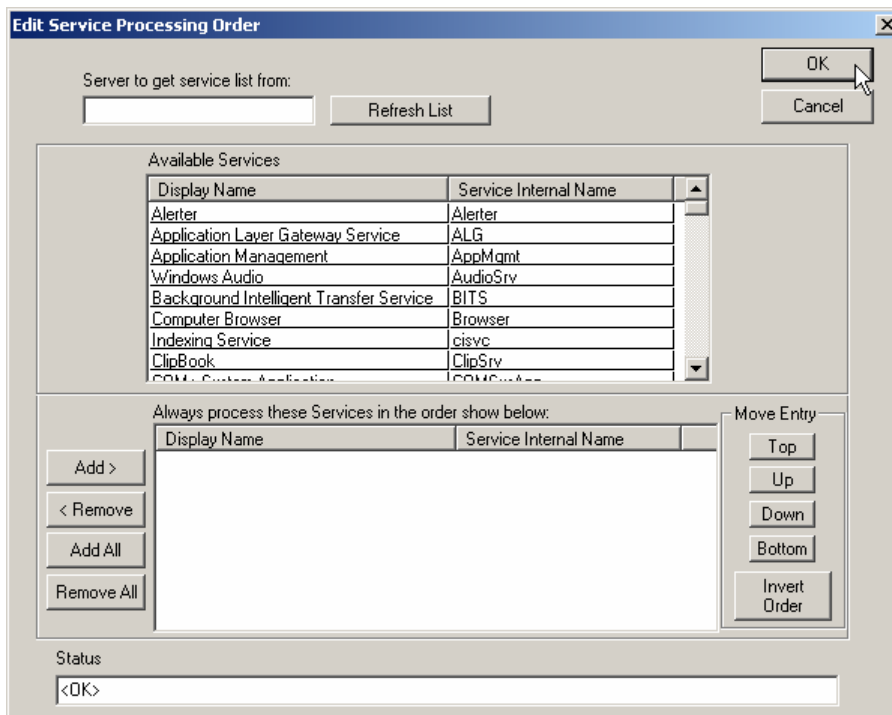
### 3. Using Service Account Manager™

In Lieberman Software's **Service Account Manager™**, a full dependency analysis is done on each service start and stop. When an administrator requests a service stop on a specific service, the program will perform the following steps:

- Prepare an initial list of all services dependent on the service to be stopped
- Walk the just prepared list and expand it to include all likewise dependent services
- Stop all entries of the just compiled list in reverse order (top down)
- Retain a list (in order of what was just stopped)

When the service is then started (after all changes have been made), all of the stopped services are then restarted but in the reverse order of their stopping.

Sometimes an administrator may need to go beyond this heuristic methodology, Service Account Manager provides an override option that allows the start/stop list entries and order to be edited manually.



### 4. Summary

The tools provided by Microsoft and third parties essentially ignore the complex dependency relationships among services. This leaves administrators on their own when attempting to change the

services of complex applications. Lieberman Software's **Service Account Manager** uses a proprietary algorithm to map the dependency relationships and then implements a staged start/stop list to accomplish the management of even the most complex dependency scenario.

Our support staff is available to answer your technical questions whether you are a customer or not.  
 Voice: 800.829.6263 (USA/Canada) Voice: (01) 310.550.8575 (Worldwide) Fax: (01) 310.550.1152 (Worldwide)  
 Web: [www.liebsoft.com](http://www.liebsoft.com) Email: [support@liebsoft.com](mailto:support@liebsoft.com)

