

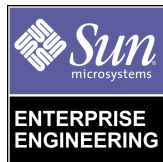


# Upgrading the Solaris™ PC NetLink Software

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*By Don DeVitt - Enterprise Engineering*

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**Sun Microsystems, Inc.**  
901 San Antonio Road  
Palo Alto, CA 94303 USA  
650 960-1300 fax 650 969-9131

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# Upgrading the Solaris™ PC NetLink Software

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Upgrading Solaris™ PC NetLink software to a new version is a reasonably straight forward procedure once you understand something about how the Solaris PC NetLink software configuration information is stored. The documentation that comes with Solaris PC NetLink software does a good job of covering the installation procedure. This article highlights some of the subtle upgrade options that many system administrators will want to be aware of as they move from one version of Solaris PC NetLink software to the next.

The standard procedure for upgrading many software modules that run on the Solaris operating environment is to backout the older version of the software with the `pkgrm` (or it's equivalent) and then install the new software with `pkgadd`. This usually means that older software executables, libraries, and setup information are removed completely and only the new software exists on the server.

Alternatively, installing the new software without de-installing the older software may be the preferred method for some packages. This can be the case if the new installation procedure, which runs during `pkgadd`, is designed to handle this situation.

Solaris PC NetLink V1.1 software is designed to handle either of these two upgrade approaches. But, it is important to know what configuration information will be carried over from the previous release and used by the new release of the software.

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# Solaris™ PC NetLink Software Databases and Installation Procedures

The Solaris PC NetLink software supports a variety of databases to maintain a Windows NT™ 4.0 style domain environment. User accounts are stored in what is known as the Security Account Manager (SAM) database. File attributes that control the Access Control Lists (ACL) are stored in an ACL database. The Solaris PC NetLink control-related information is saved in the Registry. These files are maintained in `/var/opt/lanman/datafiles`. Normally, when the Solaris PC NetLink software is removed (via `pkgrm`) or upgraded, these files are not removed. This ensures that the older configuration of the Solaris PC NetLink software is not lost during the upgrade process. If any version of the Solaris PC NetLink software is installed for the first time on a server, these files are initialized for first time use.

## SAM and ACL Databases

It is generally a good idea not to touch these files when the Solaris PC NetLink software is upgraded or removed. There is valuable system state information in these files that should be maintained when the Solaris PC NetLink software is running. If the Solaris PC NetLink software has been acting as a Primary Domain Controller (PDC), user account information should be maintained. Just as important to the account information is the ACL database that maintains the security environment for all the files and directories that have had Windows NT style ACLs placed on them. If this database were to be lost between executions of any versions of the Solaris PC NetLink software, access to these files might be lost and serious security breaches might occur if files were no longer associated with the proper ACL entries.

If, however, you want to remove all traces of a previous installation of the Solaris PC NetLink software and its databases, you must remove these database files *before* installing or upgrading the Solaris PC NetLink software. It is best to remove (`rm -r`) the `/var/opt/lanman` directory after you remove the Solaris PC NetLink software packages.

## The lanman.ini File

The `/etc/opt/lanman/lanman.ini` file is only written once during installation (with Versions 1.0 and 1.1). This file stores some Solaris PC NetLink software state information. It is typically not touched after installation and is reasonably easy to duplicate if necessary. However, if this file is altered, it is prudent to include this file in any system backups.

## Solaris™ PC NetLink Registry

The state of the Solaris PC NetLink software registry is important to consider during upgrades. The registry maintains the state of much of the Solaris PC NetLink server software. Many of the algorithms that define how the Solaris PC NetLink software works are based on variables maintained in the registry. As Sun's engineers continue to work on the Solaris PC NetLink software, not only are the executables improved, but variables in the registry are updated to improve the way the algorithms operate on a typical server.

Between the release dates for the Solaris PC NetLink Version 1.0, Version 1.0 Global, and Version 1.1, several registry settings were adjusted. These changes improved performance, reduced the memory requirements for supporting most user communities, and increased the number of Windows NT domains that can be part of a trusted environment.

If you were a user of the Solaris PC NetLink software Version 1.0, and you upgraded to Version 1.1, you probably upgraded to the new version without deleting the older versions of the registry and other Solaris PC NetLink databases. Because the initialization program for the newer version detected an existing set of ACL, SAM, and registry databases it would continue to use them. While this is a good way to maintain most of what was in the older databases, the new and improved settings for the registry database were not set. For most customers this is not a serious matter.

For environments which must maximize performance and which require that memory use be minimized, it is important to check these settings and to set them to the up-to-date values. In extreme cases, availability of the system can be threatened when the older setting forces the software to use more memory than it needs. If memory is totally consumed, performance will drop dramatically and PC Clients attempting to use the Solaris PC NetLink software may time-out while waiting to be serviced.

## Checking for Older Settings in the Registry File

There are two registry values that should be updated when upgrading from Version 1.0 to Version 1.1. As mentioned previously, these values are not be updated if an older registry exists at the time the new version of Solaris PC NetLink 1.1 software is installed.

- **VCDistribution**—This registry table defines values used by the algorithm that controls the total number of `lmx.srv` processes and rate at which these processes are spawned in a system. (For a complete explanation of this algorithm, please refer to the “Solaris™ PC NetLink Software: Performance, Sizing and Deployment” BluePrint. This book is scheduled for publication by Prentice Hall in the spring of 2000 and will be available through <http://www.sun.com/books>, [amazon.com](http://amazon.com), [fatbrain.com](http://fatbrain.com) and Barnes & Noble bookstores). The table is made up of multiple lines with three numbers separated by commas. The values in the default table for version 1.0 of the Solaris PC NetLink software are:

```
1,2,10
500,3,13
700,4,16
1000,5,20
```

For the Global 1.0 version and Version 1.1, the following values were used:

```
1,5,50
500,6,65
700,8,80
1000,10,100
```

To edit the registry over the network, you can display the setting inside your registry by looking at the registry with the Windows NT 4.0 `regedt32` program. You can also use the Solaris PC NetLink software’s own command `regconfig`. To check the values used in your registry, use the following command:

```
# /opt/lanman/sbin/regconfig \
SYSTEM/CurrentControlSet/Services/LanmanServer/Parameters \
VCDistribution
1,2,10
500,3,13
700,4,16
1000,5,20
```

Note in the “\” character is the line continuation character. This particular output shows the values for the Version 1.0 the Solaris PC NetLink software settings. This server should be updated with new values. To set the values to the Version 1.1 default settings, use the `regconfig` command with variable types and data. In the following example, the `VCDistribution` is set to reflect the values for Version 1.1. Note you must use the “\” line continuation character to enter multi-line data.

```
# /opt/lanman/sbin/regconfig \  
SYSTEM/CurrentControlSet/Services/LanmanServer/Parameters \  
VCDistribution REG_MULTI_SZ \  
1,5,50\  
500,6,65\  
700,8,80\  
1000,10,100
```

Verify the data is set correctly by using the same command without type and data.

```
# /opt/lanman/sbin/regconfig \  
SYSTEM/CurrentControlSet/Services/LanmanServer/Parameters \  
VCDistribution  
1,5,50  
500,6,65  
700,8,80  
1000,10,100
```

- **NumCLIENT\_SESSION**—This variable controls the number of trusted relationships that the Solaris PC NetLink software will support at one time. The value for this variable should be at least one greater than the trusted domains you expect to support with the Solaris PC NetLink software. The Version 1.1 value for this variable is 10.

The following command shows what happens if you look for the variable on an older registry. Because the older registry did not have a reference to the variable, you receive an error. In this case the software would use the default of 5.

```
# /opt/lanman/sbin/regconfig \  
SYSTEM/CurrentControlSet/Services/LanmanServer/Parameters \  
NumCLIENT_SESSION  
error reading value <NumCLIENT_SESSION>  
#
```

To change the value to reflect the desired setting for Version 1.1, use the following command. After making a change, always check to make sure the value was set correctly.

```
# /opt/lanman/sbin/regconfig \
SYSTEM/CurrentControlSet/Services/LanmanServer/Parameters \
NumCLIENT_SESSION REG_DWORD 10
#
# /opt/lanman/sbin/regconfig \
SYSTEM/CurrentControlSet/Services/LanmanServer/Parameters \
NumCLIENT_SESSION
10
#
```

The registry values can be changed only while the Solaris PC NetLink software is running but will not be used by the software until the next time the Solaris PC NetLink software is restarted. If the server is part of a production environment, wait until no one is using the server before restarting the Solaris PC NetLink software.

## Removing All Traces of the Solaris™ PC NetLink Software from a System

If you are removing the Solaris PC NetLink software from a server and you want to remove all account and ACL information—leaving no trace of the Solaris PC NetLink software whatsoever—you should remove the `/var/opt/lanman` and `/etc/opt/lanman` directories after you run `pkgrm`. If you are moving the Solaris PC NetLink software to another server, back up these directories and restore them to the new server.

## Backing Up Your Solaris™ PC NetLink Database

Before upgrading, and as part of any normal backup procedure, you should backup all Solaris PC NetLink databases with the Solaris PC NetLink software's Server Manager (a.k.a., Sunlink Server Manager), `/opt/lanman/sbin/slsmgr`. The Solaris PC NetLink registry can usually be backed up while the Solaris PC NetLink software is running because it is rarely changed during normal operation. The SAM and ACL databases change frequently, making it impossible to back them up while the Solaris PC NetLink software is in use. The Solaris PC NetLink Server Manager software can be also be used to stop and restart the Solaris PC NetLink server software as part of the backup procedure. The high level point to remember here is

that the Solaris PC NetLink software (*not* the Solaris operating environment) must be stopped to perform a backup. This means that the backup procedure must be performed when no one is using the server.

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## References

For more detailed information about the Solaris PC NetLink software, refer to the *Solaris™ PC NetLink Software: Performance, Sizing and Deployment BluePrint*. This book is scheduled for publication by Prentice-Hall in the spring of 2000 and will be available through [www.sun.com/books](http://www.sun.com/books), [amazon.com](http://amazon.com), [fatbrain.com](http://fatbrain.com), and Barnes & Noble bookstores.

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### *Author's Bio: Don De Vitt*

*Don has been on the development teams of almost every software and hardware PC inter operability product Sun Microsystems has produced over the last 13 years. Don is currently a PC inter operability specialist within the Enterprise Engineering group and is a member of the Solaris™ PC NetLink engineering team where he has focused on performance-related issues.*

*Don DeVitt started his career as an electrical engineer and worked in the Automated Test industry (Teradyne Inc.), and PC operating system market (Digital Research from CP/M fame) before coming to Sun.*