Managing the Solaris™ PC NetLink Registry

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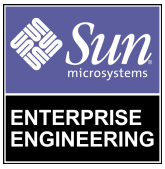

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The January 2000 Sun BluePrints™ article covered the topic of upgrading the Solaris™ PC NetLink software. In that article, the Solaris PC NetLink registry was updated to values defined by the Version 1.1 settings of the software.

Developing procedures to log changes to the registry should be a fundamental part of system maintenance, especially when multiple system administrators are maintaining the same system, or if you are maintaining several servers.

A well defined registry recovery procedure should be part of any server recovery plan. This will allow system administrators to reinstate the server to a predefined state with minimum downtime.

Information in this article will assist you in defining policies and procedures for maintaining the changes made to the registry of your Solaris PC NetLink software.

Backup your Solaris PC NetLink Registry

Before attempting the procedures in this article, a backup of the Solaris PC NetLink registry should be made with the Solaris PC NetLink Server Manager. (`/opt/lanman/sbin/slsmgr`)

Backing up the registry requires stopping the Solaris PC NetLink software to perform the procedure. This is clearly something you want to avoid on a production server. An alternative to backing up the registry database (but not the ACL and SAM databases) would be to copy the registry file to a backup directory while the Solaris PC NetLink software is in operation.

The Solaris PC NetLink registry rarely gets updated during normal operation and it is extremely unlikely that you would copy a registry that is in the process of being modified. To verify you have a copy of the registry that was not in the process of being modified, you can follow the `copy` operation by a `diff` operation to see if there are any changes between the `cp` and `diff`.

Here is an example of backing up the registry using that procedure.

```
sys1# cp /var/opt/lanman/datafiles/registry /files1/pcnlbackups/registry.000110
sys1# diff /var/opt/lanman/datafiles/registry /files1/pcnlbackups/registry.000110
sys1#
```

In the unlikely event that the `diff` command detects a difference between the backup copy and the working copy of the registry, you should perform the commands again to identify any changes that occurred. As soon as the `diff` command sees no differences between the two versions, you have obtained a stable registry.

Formalizing Changes to the Registry

As previously mentioned, registry values may change between releases of Solaris PC NetLink software, additionally, work-arounds or patches may also require changes to the registry. Unfortunately neither Solaris PC NetLink nor Microsoft Windows NT 4.0 automatically log changes to the registry. The number of entries in the registry can be quite large, thereby making a visual inspection of changes difficult.

If no policies are in place to identify changes made to the registry, it is quite possible that the reason for any change can be forgotten. This could make it difficult to reconfigure an existing server to a pre-defined state, or configure a new server to the same state as an existing server.

Even if a copy of the registry has been made, changes could be forgotten by the system administrator. The following information will define policies and procedures to assist in managing a Solaris PC NetLink registry.

Maintain a Registry Change Script for Each Server

The key to maintaining change control of the registry, is to create and maintain one script file that has all the registry changes for that server. The script file should contain every command necessary to update the registry from the state, following the initial installation, to the final state of your desired environment. It is *vital* to add comment lines, with dates, to identify the reason for each change.

The following script (`registry.changes`) performs the changes that were suggested in last months article. In that article it was suggested to upgrade Solaris PC NetLink registry values to the more desirable values used by Version 1.1. This script will update the registry using the Solaris PC NetLink command: `regconfig`. The value will be read back from each entry as confirmation that the change did take place.

Solaris PC NetLink Registry Change Script - `registry.changes`

```
#! /bin/sh -u
# Solaris PC NetLink Registry change script
# Place ALL changes to registry here. Follow each change
# With a readback of the value from the registry
#
echo The following Solaris PC NetLink registry entries
echo have been set to the values listed
echo
####################
#
# 1/10/2000 - The following registry change will ensure Solaris PC NetLink is running
# with the latest V1.1 recommended values that control lmx.srv  process spawning
# Default value for Version 1.1
#
/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
#
# Follow up change with a readback of value from registry
#
echo VCDistribution
/opt/lanman/sbin/regconfig \
SYSTEM/CurrentControlSet/Services/LanmanServer/Parameters \
VCDistribution
echo
####################
#
# 1/10/200 This variable controls the number of trusted relationships
# that Solaris PC NetLink will support at one time.
# Default value for Version 1.1
#
/opt/lanman/sbin/regconfig \
SYSTEM/CurrentControlSet/Services/LanmanServer/Parameters \
NumCLIENT_SESSION REG_DWORD 10
#
# Follow up change with a readback of value from registry
#
echo NumCLIENT_SESSION
/opt/lanman/sbin/regconfig \
SYSTEM/CurrentControlSet/Services/LanmanServer/Parameters \
NumCLIENT_SESSION
echo
####################
#
# Place next registry change here
#
```

- Script Notes

  The "\" character is used force the shell to continue the command on the next line.

  It may appear the quotes (") are not balanced, when in fact they are. The quotes are used to force a new line within the entry of a command. (If you are viewing this article on-line you will be able to copy and paste the script into your script editor)

  Ensure the execution of the script as the root user.

  A sample execution of the script, running as super user, should look like this:

```
sys1# ./registry.changes
The following Solaris PC NetLink registry entries
have been set to the values listed

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

NumCLIENT_SESSION
10

sys1#
```

Determining Changes Made to the Registry

After installing Solaris PC NetLink software, and making changes to the registry, you now want to create a registry change script to document any changes to ensure you will be able to reinstate the server to it production state. It would be helpful to find out what changes have been made to the registry since the Solaris PC NetLink software was installed. Unfortunately, there is no single command to do this.

The Solaris PC NetLink command, `regcheck -D, can` be used to dump the registry in detail. It is possible, but very difficult, to use this ASCII output of the registry with the Solaris™ Operating Environment `diff` command to identify

changes made to a registry. Unfortunately, the output from the `diff` command, when comparing this output in ASCII with a previous ASCII output of the registry, does not align well, even if there has been a only few changes. This makes sorting out any differences difficult.

The solution that generates the most concise list of differences, involves using the Windows NT 4.0 `regedt32` registry editor tool to create a before and after ASCII file representation of the registry, and then use the Solaris Operating Environment `diff` command to identify the differences. This procedure is outlined below:

▼ To View Changes to a Solaris PC NetLink Server Registry

1. Install and configure your Solaris PC NetLink Server software.
2. Before making any changes to the Solaris PC NetLink registry, use the NT 4.0 `regedt32.exe` tool to dump the registry from the NT machine to an ASCII file on the Solaris PC NetLink server. The steps to perform this are:
   a. From the Windows NT 4.0 Server machine, Map a Network Drive to the Solaris PC NetLink machine. This drive is where you will store the ASCII output of the registry.
   b. From the Windows NT 4.0 Server machine, launch the `regedt32` program by entering `regedt32` in the **/Start/Run** window.

- Note: You will need administrator privileges on both machines.

   c. Type the name of your Solaris PC NetLink Server in the window that appears after selecting the **/Registry/Select_Computer Menu** entry.
   d. Use the **/Registry/Save Subtree As** menu selection, to save the registry to a file on the Solaris PC NetLink machine. Name the file `originalreg.txt` to identify it as the reference “no change” registry ASCII dump.
3. After making changes to the Solaris PC NetLink registry you can repeat the procedure to create a second file. Name it `changedreg.txt.`
4. On the Solaris PC NetLink server, navigate to the directory where you placed the ASCII files of the registry.
5. Use the command: `diff -C 3 originalreg.txt changedreg.txt` to see any differences between the two files.

- Note: This procedure can be used to track registries on Microsoft Windows NT 4.0 servers as well as the registries on Solaris PC NetLink servers.

▼ Sample Output

The following example shows the output you should expect if you compared the registry edited with the script presented earlier in this article with the original registry that came with Solaris PC NetLink. It can be seen that the `NumCLIENT_SESSION and VCDistribution` registry values have been added to the registry.

- Note: Some output has been removed to keep the listing short.

```
*** changedreg.txtMon Jan 10 15:38:44 2000
--- originalreg.txtMon Jan 10 15:55:38 2000
***************
*** 2148,2154 ****
. . . . .
Value 8
+   Name:            NumCLIENT_SESSION
+   Type:            REG_DWORD
+   Data:            0xa
+
. . . . .
+ Value 13
+   Name:            VCDistribution
+   Type:            REG_MULTI_SZ
+   Data:            1,5,50
+ 500,6,65
+ 700,8,80
+ 1000,10,100
. . . . .
```

Acquiring an Unaltered Solaris PC NetLink Registry

The preceding operation compares an unchanged registry with one that has already been modified. If you changed the registry prior to reading this document, you will need to acquire a copy of the registry in ASCII format before any changes have been made.

To do this, you need to get an unchanged registry ASCII dump from another server where the registry has not been changed. Alternatively, you can acquire one by temporarily loading an unaltered copy of a register with the `regload` command.

The Solaris PC Netlink command will create a new registry if it does not see one in the `/var/opt/lanman/datafiles` directory.

- Note: The following procedure will require stopping Solaris PC NetLink, so schedule this operation for off hours.

▼ Method:

1. Login as the root user.
2. Make a backup of the current working registry with Solaris PC NetLink Server Manager.

- Note: This step is critical, as you will be temporarily removing the registry in the following steps.

3. Stop the Solaris PC NetLink server software by using Solaris PC NetLink Server Manager.
4. Remove the registry using the command:
   `rm /var/opt/lanman/datafiles/registry`
5. Create a new, unaltered registry with the command:
   `/opt/lanman/sbin/regload command/opt/lanman/sbin/regload`
6. Start the Solaris PC NetLink server software by using the Solaris PC NetLink Server Manager.
7. Follow the procedure from step #2 in the section “To View Changes to a Solaris PC NetLink Server Registry” to get an ASCII file of the registry.
8. Restore the registry that was backed up in step #2

After completing these steps you should have an ASCII file you can compare to any future registry changes.

- Note: To prevent the necessity of using this procedure, ensure a copy of the ASCII file for the registry is made for any new version of Solaris PC NetLink software *before* changes are made.

Summary

Highly Available servers require well documented procedures for maintaining the state server. Changes to the Solaris PC Netlink registry occur infrequently, so the need for documenting and managing the changes is critical.

References

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

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Don has been on the development teams of almost every software and hardware PC interoperability 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.