



Global Information Assurance Certification Paper

Copyright SANS Institute
Author Retains Full Rights

This paper is taken from the GIAC directory of certified professionals. Reposting is not permitted without express written permission.

Interested in learning more?

Check out the list of upcoming events offering
"Security Essentials Bootcamp Style (Security 401)"
at <http://www.giac.org/registration/gsec>

Securing Solaris

Angela Orebaugh

October 2, 2000

When configuring a Solaris system for production, a balance must exist between system manageability and security. It is necessary to determine the role the system will play in order to determine what services it needs to run. The objective is to keep things simple. By dedicating separate machines for different tasks, it is expected that only one or two services will run on a host. This methodology makes it easier to isolate applications, harden, and troubleshoot. This type of minimalist approach runs only what is absolutely necessary. Keeping a Solaris system secure is a daily task. This includes keeping up on exploits, patches, and reviewing log files. The following suggestions are just the beginning to securing your Solaris system. There are some additional steps that may need to be taken depending on the systems role in the organization, and some of the steps listed may not apply. Consulting the listed references for additional information is highly recommended.

1. Install the Operating System

Securing a Solaris system starts with the installation. This consists of an "initial" install of the latest version of the Solaris operating system. With every new release, Sun incorporates improvements and additional features to enhance system security. Be sure that the system is disconnected from the network, or connected to an isolated network while performing the install and the subsequent hardening tasks. Attaching the system to a public network before it is secured can lead to a possible compromise. To get the necessary patches, use a second machine to download the files and burn them to CD-ROM, or connect to the isolated network to transfer them.

Choosing the minimum "core" install increases security by reducing the amount of software and possible exploits. The core installation also decreases the amount of disk space needed for the install. Additional necessary packages can be added at a later time.

The system will need to be partitioned to allocate disk space for system files, logging and applications. The four recommended partitions are /, /usr, /var and /opt. The /usr and /opt partitions are used for application installation. The size of these partitions varies according to available disk space and the size of the applications being installed. The /var partition is used for system logging and protects the root (/) partition from overflowing. The /swap partition is created automatically from the initial install.

2. Apply Patches

Once the initial installation is complete and the system has rebooted, it is time to install the patches. Recommended Patch Clusters can be downloaded from Sun at <http://www.sunsolve.sun.com>. Maintenance Updates (MU) are also available to service contract customers. They should be applied before the Recommended Patch Clusters. If a patch fails with a "return code 8", then the patch applies to a package not installed on the system. A "return code 2" indicates that the patches have already been applied.

3. Secure the inetd

The next step to securing Solaris is the removing unnecessary services from the inetd.conf file. This can be done by placing a pound sign (#) in front of the line that is not needed. It is ideal to comment out everything in the inetd.conf file and add them back as needed. Telnet and FTP will be replaced with SSH. Ideally, comment out ftp, tftp, systat, rexd, ypupdated, netstat, rstatd, rusersd, sprayd, walld, exec, talk, comsat, rquotad, name, uucp, sadmind, login, finger, chargen, echo, time, daytime, discard, telnet, imap, pop3, dtspc, fs, kcms, and all rpc services.

4. Secure the startup scripts

The startup scripts reside in /etc/rc2.d and /etc/rc3.d. Many of the services here are not needed and pose potential security vulnerabilities. To stop a script from starting, replace the capital S with a lowercase s (or K with a lowercase k). Some example services that should be disabled are:

Automounter /etc/rc2.d/S74autofs

Sendmail /etc/rc2.d/S88sendmail and /etc/rc1.d/K57sendmail

RPC /etc/rc2.d/S71rpc

```
SNMP /etc/rc2.d/S76snmpdx
```

```
NFS server /etc/rc3.d/S15nfs.server
```

```
NFS client /etc/rc2.d/S73nfs.client
```

5. Enable logging

The default Solaris system logging occurs in `/var/adm`. Enable additional logging by creating two additional logging files, `/var/adm/sulog` and `/var/adm/loginlog`. The `sulog` will log successful and unsuccessful `su` attempts. The `loginlog` will catch consecutive failed login attempts. Enable the files by:

```
#touch /var/adm/sulog
```

```
#touch /var/adm/loginlog
```

```
#chmod 600 /var/adm/sulog
```

```
#chmod 600 /var/adm/loginlog
```

```
#chown root /var/adm/sulog
```

```
#chown root /var/adm/loginlog
```

```
#chgrp sys /var/adm/sulog
```

```
#chgrp sys /var/adm/loginlog
```

Uncomment the following line in `/etc/syslog.conf` to log authentication messages:

```
#auth.notice ifdef('LOGHOST', /var/log/authlog, @loghost)
```

Then perform the following to create the proper `authlog` file:

```
#touch /var/log/authlog
```

```
#chmod 600 /var/log/authlog
```

```
#chown root /var/log/authlog
```

6. Miscellaneous security tasks

Set the TCP initial sequence number generation parameters to protect against hijacking and spoofing.

In the file `/etc/default/inetinit` set `TCP_STRONG_ISS=2`

Protect against buffer overflow attacks by adding the following to `/etc/system`:

```
Set noexec_user_stack=1
```

```
Set noexec_user_stack_log=1
```

Ensure that root can only access the console by making sure the following line in `/etc/default/login` is not commented out:

```
CONSOLE=/dev/console
```

Remove, lock or comment out unnecessary accounts, including "sys", "uucp", "nuucp", "smtp" and "listen". The best way to disable them is to put `"*LK*"` in the password field of the `/etc/shadow` file. The following command line options can also be used to remove or lock accounts:

```
Remove – #passmgmt –d account
```

```
Lock – #passwd –l account
```

Change the /etc/motd to contain warnings about inappropriate and unauthorized use of the system.

Remove sendmail packages – SUNWsndmr and SUNWsndmu

Remove group write permission of the /etc directory by performing the following:

```
chmod -R g-w /etc
```

Disable routing by performing the following:

```
#touch /etc/notrouter
```

Remove /etc/hosts.equiv, /.rhosts

Disable the Stop-A abort sequence by changing the following in /etc/default/kbd:

```
KEYBOARD_ABORT=disabled
```

Enable EEPROM security:

```
#eeprom security-mode=full
```

New password: password

Retype new password: password

Do not make this password the same as root. Setting the security level to full requires a password to boot the system. "Command", instead of "full", may be used to provide protection without the need of a boot password.

7. Installing SSH

SSH is used for secure communications to the Solaris system. It encrypts all communications to the system. SSH has its own logging and access control, like TCP Wrapper, but is more secure since traffic cannot be sniffed. SSH can be obtained from <http://www.ssh.com> or <http://openssh.com>.

8. YASSP

Another resource to consider using is YASSP – Yet Another Secure Solaris Package. It automates some of the changes above and incorporates additional functionality such as Tripwire, TCP Wrappers, and a version of SSH. It can be found at <http://yassp.parc.xeorx.com>. It is recommended to install YASSP, then perform steps 3 through 7 as a safety check.

Boran, Sean. "Hardening Solaris: Securely Installing a Firewall Bastion Host." 25 October 1999. <http://securityportal.com/cover/coverstory19991025.html> (25 Sept. 2000)

Carnegie Mellon University. "Installing and Securing Solaris 2.6 Servers." 14 June 2000. <http://www.cert.org/security-improvement/implementations/i027.02.html> (24 Sept. 2000)

Galvin, Peter. "The Solaris Security FAQ." 7 July 2000. <http://www.sunworld.com/common/security-faq.html> (23 Sept. 2000)

Noordergraaf, Alex and Watson, Keith. "Solaris™ Operating Environment Minimization for Security: A Simple, Reproducible and Secure Application Installation Methodology." December 1999. <http://www.sun.com/blueprints/1299/minimization.pdf> (23 Sept. 2000)

Noordergraaf, Alex and Watson, Keith. "Solaris™ Operating Environment Network Settings for Security." December 1999. <http://www.sun.com/blueprints/1299/network.pdf> (23 Sept. 2000)

Noordergraaf, Alex and Watson, Keith. "Solaris™ Operating Environment Security." January 2000.

<http://www.sun.com/blueprints/0100/security.pdf> (23 Sept. 2000)

Spitzner, Lance. "Armoring Solaris." 27 August 2000. <http://www.enteract.com/~lspitz/armoring.html> (24 Sept. 2000)

© SANS Institute 2000 - 2005, Author retains full rights.

Upcoming Training

Click Here to
{Get CERTIFIED!}



SANS Stockholm 2017	Stockholm, Sweden	May 29, 2017 - Jun 03, 2017	Live Event
SANS San Francisco Summer 2017	San Francisco, CA	Jun 05, 2017 - Jun 10, 2017	Live Event
SANS Houston 2017	Houston, TX	Jun 05, 2017 - Jun 10, 2017	Live Event
Security Operations Center Summit & Training	Washington, DC	Jun 05, 2017 - Jun 12, 2017	Live Event
Community SANS Ottawa SEC401	Ottawa, ON	Jun 05, 2017 - Jun 10, 2017	Community SANS
SANS Rocky Mountain 2017	Denver, CO	Jun 12, 2017 - Jun 17, 2017	Live Event
SANS Charlotte 2017	Charlotte, NC	Jun 12, 2017 - Jun 17, 2017	Live Event
SANS Rocky Mountain 2017 - SEC401: Security Essentials Bootcamp Style	Denver, CO	Jun 12, 2017 - Jun 17, 2017	vLive
SANS Secure Europe 2017	Amsterdam, Netherlands	Jun 12, 2017 - Jun 20, 2017	Live Event
Community SANS Portland SEC401	Portland, OR	Jun 12, 2017 - Jun 17, 2017	Community SANS
SANS Minneapolis 2017	Minneapolis, MN	Jun 19, 2017 - Jun 24, 2017	Live Event
SANS Columbia, MD 2017	Columbia, MD	Jun 26, 2017 - Jul 01, 2017	Live Event
SANS Cyber Defence Canberra 2017	Canberra, Australia	Jun 26, 2017 - Jul 08, 2017	Live Event
SANS Paris 2017	Paris, France	Jun 26, 2017 - Jul 01, 2017	Live Event
SANS London July 2017	London, United Kingdom	Jul 03, 2017 - Jul 08, 2017	Live Event
Cyber Defence Japan 2017	Tokyo, Japan	Jul 05, 2017 - Jul 15, 2017	Live Event
SANS Cyber Defence Singapore 2017	Singapore, Singapore	Jul 10, 2017 - Jul 15, 2017	Live Event
Community SANS Minneapolis SEC401	Minneapolis, MN	Jul 10, 2017 - Jul 15, 2017	Community SANS
SANS Los Angeles - Long Beach 2017	Long Beach, CA	Jul 10, 2017 - Jul 15, 2017	Live Event
SANS Munich Summer 2017	Munich, Germany	Jul 10, 2017 - Jul 15, 2017	Live Event
Community SANS Phoenix SEC401	Phoenix, AZ	Jul 10, 2017 - Jul 15, 2017	Community SANS
Mentor Session - SEC401	Macon, GA	Jul 12, 2017 - Aug 23, 2017	Mentor
Mentor Session - SEC401	Ventura, CA	Jul 12, 2017 - Sep 13, 2017	Mentor
Community SANS Atlanta SEC401	Atlanta, GA	Jul 17, 2017 - Jul 22, 2017	Community SANS
Community SANS Colorado Springs SEC401	Colorado Springs, CO	Jul 17, 2017 - Jul 22, 2017	Community SANS
SANSFIRE 2017	Washington, DC	Jul 22, 2017 - Jul 29, 2017	Live Event
SANSFIRE 2017 - SEC401: Security Essentials Bootcamp Style	Washington, DC	Jul 24, 2017 - Jul 29, 2017	vLive
Community SANS Charleston SEC401	Charleston, SC	Jul 24, 2017 - Jul 29, 2017	Community SANS
Community SANS Fort Lauderdale SEC401	Fort Lauderdale, FL	Jul 31, 2017 - Aug 05, 2017	Community SANS
SANS San Antonio 2017	San Antonio, TX	Aug 06, 2017 - Aug 11, 2017	Live Event
SANS Prague 2017	Prague, Czech Republic	Aug 07, 2017 - Aug 12, 2017	Live Event