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1. Introduction

This benchmark provides recommendations on security settings for Mac OS X Tiger. The recommendations are aimed at general purpose Mac OS X systems used primarily by a single person in an ordinary office environment. Notebook computers used by travelling users are also covered. Neither servers nor other special-purpose systems are addressed.

An important goal of the recommendations is to maintain the unique functionality and ease-of-use of the Macintosh system by using the security features built in to the system by Apple. The security settings are prudent rather than paranoid, and are intended to be applicable to nearly all Mac OS X systems.

Note that the default security settings of Mac OS X are quite good. Millions of people use the default installation of Mac OS X on their home computers, and safely connect to the Internet.

The benchmark recommends additional settings which further improve system security over the defaults.

Description
This document is a CIS Level I benchmark for Mac OS X 10.4 Tiger. A Level I benchmark is the prudent level of minimum due care with respect to system security.
2. Rules

2.1. Rule: Start from a fresh installation of Mac OS X

In order to start from a known state and have confidence in the integrity of the system software, it is best to begin configuration from a fresh installation of the operating system.

Under ideal circumstances, the computer will remain physically disconnected from the network until it has been fully configured and patched. In this case, software updates from Apple must be downloaded to a separate system, checked for authenticity via their SHA-1 hashes, and written to removable media. The removable media can then be used to update the newly installed system. (Use `openssl sha1 file-name` to compute the SHA-1 hash of a file.)

If, however, disconnected installation is not feasible, the risk of attaching the system to the network and downloading the updates via the Software Update preference pane is relatively small.

When installing the system from the distribution, the defaults are acceptable. If, however, there are printer drivers, languages, or fonts that you will not be using, you may deselect them.

During the installation process, you will be prompted to create a user name and password for an initial account. This account will be an administrator. Pick a name for the account, and select a good password for it. Regular user accounts will be created later.

If you are unable to start from a fresh installation, the benchmark settings will still be useful, but it is possible that the system may have been altered in some not easily detectable way that might leave it vulnerable to unauthorized access or use.

2.2. Rule: Check for software updates regularly

Software sometimes contains defects that may make a system subject to unauthorized access. Apple provides software updates to correct these defects.

Ideally, software updates should first be tested on a laboratory system before applying them to systems used for real work. However, it is often not easy or possible to find time or resources to do this. Therefore, it is generally worthwhile to go ahead and apply the software updates from Apple, accepting the small risk that the update might cause a problem with the system.

The alternative of simply not applying the update, thereby leaving known software defects in place, is probably a greater risk on a general purpose system.

Remediation

In the Software Update preference pane, check the "Check for updates" box, and select "Weekly" or "Daily" from the pop-up menu.

2.3. Rule: Enable network time synchronization

Accurate time is an important security tool. It enables log file timestamps to be correlated across systems. Certain network authentication protocols, such as Kerberos (which is a component of both Apple's Open Directory and Microsoft's Active Directory), also rely on accurate time.
Remediation

In the Date & Time preference pane, check the "Set date & time automatically" box. If you have a local time server, enter it in the text field. Otherwise, select a geographically appropriate Apple time server.

2.4. Group: Configure locking screen saver

A locking screen saver can prevent unauthorized access by casual passers-by. The locking screen saver is like the lock on a car door: it deters casual mischief and attacks of opportunity. This action must be done for every user on the system.

2.4.1. Rule: Require a password to unlock the screen saver

Remediation

In the Security preference pane, check the "Require password to wake this computer from sleep or screen saver" checkbox. This action must be done for every user on the system.

2.4.2. Rule: Set the screen saver to appear after a period of inactivity

Remediation

In the Desktop & Screen Saver preference pane, set the screen saver to start after 15 minutes (or some other interval determined by local policy) of inactivity. Also set a hot corner so that the screen saver can be activated on demand. This action must be done for every user on the system.

2.5. Rule: Disable automatic login

To make the use of the computer easier for consumer users, the default installation of Mac OS X automatically logs the user into the system upon reboot.

Disable this feature so that unauthorized access to the computer cannot be gained simply by power-cycling the computer.

Remediation

In the Security preference pane, check the "Disable automatic login" checkbox.

2.6. Rule: Disable root login

By default on a clean OS X installation, the root account is disabled and has a blank password. It is recommended that the root account be left disabled.

Remediation

If you wish to further secure the root account by preventing other local administrators from enabling it, you can follow these steps to protect it with a non-trivial password:

1. Open "NetInfo Manager", found in the "Utilities" folder,
2. Select "Security --> Authenticate" (or click the lock icon) to authenticate as a local administrator,
3. Select "Security --> Enable Root User" and set a non-trivial password for the root account,
2.7. Rule: Normal use should be as a regular user, not an administrator

It is generally preferable to use a non-administrator account for day-to-day work. The system will typically prompt for an administrator user name and password when additional privilege is required to perform a particular operation, so it's rarely necessary to log in as an administrator. Should trickery or software defects result in the execution of some sort of malware, damage will be limited only to areas over which the normal user account has control. If the logged in account were an administrator, the malware could write to files in /Applications/ and other locations that are writable by the admin group. It may also be easier to obtain root privileges from an administrator account.

Remediation

In the Accounts preference pane, create an additional account, and be sure that the "Allow user to administer this computer" is cleared. Do not enter a password hint. Log in using this account, and use the administrator account name and password only as required.

This is also a good time to verify that there are no extraneous accounts present, especially if the system being configured was not loaded with a fresh installation of Mac OS X.

2.8. Rule: Display login banner

Many organizations require that a message be displayed to users before they log in. The login window can display such a banner.

Remediation

To make the login window display a pre-login message, run the following command as an administrator user (all on one line):

```
sudo defaults write /Library/Preferences/com.apple.loginwindow LoginwindowText 'your banner text here'
```

2.9. Rule: Leave unused services disabled

Services are managed from the Sharing preference panel. By default, all services on Mac OS X are off. Enable only the services necessary.

If possible, enable a service only for the duration of its use. Disable the service when done using it.

The remote login service, which turns on sshd, is a commonly enabled and useful service.

The FTP service should probably never be used, since it transmits passwords over the network in clear text.

The services in the Sharing preference panel all relate to sharing information on the local computer with remote users. You do not need to enable any of the services in order to access files stored on remote systems. For example, it is not necessary to enable Windows file sharing to access files stored on a Windows server.

Remediation

In the Sharing preference pane, click on the "Services" tab and ensure that unused services are turned off. If there is any doubt, leave all services disabled (unchecked).
2.10. Rule: Enable firewall

The built-in firewall is managed from the Firewall tab of the Sharing preference panel.

By default, the firewall blocks all inbound TCP traffic not initiated from the system. It does not block outbound traffic, nor does it block any UDP traffic. When services are enabled from the Sharing preference panel, rules are added to the firewall to allow access to those services.

Remediation

In the Sharing preference pane, click on the "Firewall" tab and click the "Start" button to enable the firewall.

2.11. Rule: Enable logging

If your organization has a central log host, direct log messages to it. If not central log host exists, local log files can be found in /var/log by default. These logs can server as a valuable resource in tracking possible security issues, so be sure to review them as often as possible.

Remediation

Add the following line to /etc/syslog.conf (where your.log.host is the name of your central log server).

* @your.log.host

2.12. Rule: Configure sshd

If the Remote Login service will be enabled, some additional configuration of sshd is recommended.

Remediation

Edit /etc/sshd_config and make the following modifications:

- Edit the "#Protocol 2,1" line to read "Protocol 2". Version 1 of the SSH protocol contains flaws that are not present in protocol version 2.
- Ensure that PermitRootLogin is set to "NO".
- It is assumed that all local user accounts will have SSH access. If this isn't desired, or if the system will be used in a directory service environment, add a line "AllowUsers user1 user2 user3" to limit login access to the listed users. Otherwise, anyone with an account in the directory will be able to log in to the system.
- To make sshd display a pre-login message, first create a file called (for example) /etc/banner, and put the desired message text in it.

Then, edit the "#Banner /some/path" line to read "Banner /etc/banner".

2.13. Rule: Use good passwords

Use a good password on your account. Apple provides a tool called the password assistant to help with selecting a good password.

This account password is very important: it should be used only for your Mac OS X account. Don't use it
for a web site password, or for any other purpose. Never type the password in on a computer that you do not control (e.g., from a kiosk or a computer in an internet cafe).

**Remediation**

Open the Accounts preference panel and click on the password tab. Click the "Change Password..." button, and click on the small picture of the key to the right of the "New Password" field to bring up the password assistant. You can have the assistant suggest a password for you, or come up with one yourself. A 12-character "memorable" password (as generated by the Password Assistant) is typically pretty easy to remember, and strong as well. Following your organization's password complexity rules will help you formulate a good password.

When the password quality bar turns green, your password is good.

The "pwpolicy" command can be used to enforce the use of good passwords and is installed by default. See the associated man page for additional information.

**2.14. Rule: Find world-writable files**

Software installers are generally bad about leaving files and directories world-writable. Use the command

```
find /Applications /Library \( -type d -or -type f \) -perm +0002 -print
```

to get a list of world-writable directories and files in the usual suspect locations.

One quick way to remove world-writable permissions from all of these files is to run this command:

```
find /Applications /Library \( -type d -or -type f \) -perm +0002 -print -exec chmod o-w {} \;
```

**2.15. Group: Encrypt home directory and swap files**

Encrypting swap files and user home directories will maintain the confidentiality of the data stored on the computer, even if the computer is lost or stolen. Note that OS X supports the creation of encrypted disk images to protect specific data. This is a valid option to using FileVault on the entire home directory.

**2.15.1. Rule: Configure FileVault**

FileVault transparently encrypts users' home directories. It must be enabled on a per-user basis.

For more information about FileVault, see Apple's documentation.

**Warning!** If the user forgets his login password, and also loses the master password, his data will be unrecoverable. If the FileVault passwords cannot be reliably managed, the risk of data loss probably outweighs the security benefits, and FileVault should not be enabled.

**Remediation**

Open the Security preference panel. To enable FileVault, first set a master password by clicking on the "Set Master Password..." button. The password assistant (click on the "?” button to the right of the Master Password text field) can help with selecting a strong password. Don't enter a password hint. Write down the
master password, seal it in an envelope, and store it in a safe or some other secure location. Now turn on
FileVault by pressing the "Turn On FileVault" button.

Your organization may have a policy for managing the master password. If so, follow it by giving the
master password to the appropriate organizational representative.

2.15.2. Rule: Configure secure virtual memory

Enabling secure virtual memory causes the swap files on the disk to be encrypted. It is possible for an
attacker to look through the swap files on a stolen disk in search of passwords or other sensitive data;
encrypting the swap files prevents this.

Remediation

Open the Security preference pane and click the "Use secure virtual memory" checkbox. The system must
be rebooted in order for this setting to take effect.

2.16. Rule: Disable Bluetooth

Ensure that Bluetooth is disabled on all systems unless absolutely needed.

Remediation

Open the System Preferences pane, then Bluetooth. Click the Settings tab (if needed), then click the "Turn
Bluetooth Off" button.
3. Profiles

3.1. Profile: Desktop system settings

Description

Use these settings for desktop Mac OS X systems.

Item Selections

Rules and Groups explicitly selected and deselected for this profile.

- Included: Start from a fresh installation of Mac OS X
- Included: Check for software updates regularly
- Included: Enable network time synchronization
- Included: Configure locking screen saver
- Included: Disable automatic login
- Included: Normal use should be as a regular user, not an administrator
- Included: Display login banner
- Included: Leave unused services disabled
- Included: Enable logging
- Included: Configure sshd
- Included: Use good passwords
- Included: Find world-writable files
- Included: Disable Bluetooth
- Included: Disable root login

3.2. Profile: Notebook system settings

Extends: Desktop system settings

Description

Use these additional settings on portable Mac OS X systems. These settings could also be applied to desktop systems at administrator discretion.

Item Selections

Rules and Groups explicitly selected and deselected for this profile.

- Included: Enable firewall
- Included: Encrypt home directory and swap files
- Included: Disable Bluetooth
Appendix A: NIST 800-53 Mappings

This section contains references to the NIST 800-53 specification. It is intended for those who are required or desiring to map each recommendation in the benchmark to the associated 800-53 control.

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5. References

1. Apple product security web site. [link]
2. Apple security updates. [link]
3. Apple Mac OS X Common Criteria guide and tools (includes auditing tools). [link]
4. NIST Special Publication 800-53. [link]
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