Homework #5 Solution

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Network Administration

1.

Enable DHCP snooping to drop packets from unauthorized DHCP servers. (10%)

DNS

1.

Because of DNS delegation, ntu.edu.tw doesn't hand the control to you, so no client would ever know your existence. (5%)

2.

1. in-addr.arpa. (5%)

2. Because a domain name is resolved from right to left, but an IP address is interpreted(and delegated) from left to right. See https://technet.microsoft.com/en-us/library/cc730980(v=ws.11).aspx for detailed explanation. (5%)

3.

1. Use so-called "whois" service. It discloses data like registrant's name, phone number, contact address, and so on. (2%)

2. domain-admin@icann.org (3%)

4.

1. The time it takes for a (new) dns record to get into everyone's cache/computer. (5%)

2. Because TTL is 3600, everyone who queries this record keeps this data in cache for 3600 seconds. Therefore, you need to wait for one hour for the old data to expire, and clients will come to fetch the new data. (5%)

5.

1. A DNS resolver that resolves everyone's recursive dns queries. (5%)

2. It can facilitate DDOS (DNS amplification attack). (5%)

System Administration

1. For updating packages, these two commands are identical. However, `yum upgrade` may delete old and obsolete packages. (3%)

2. Adding `--obsolete` to `yum update` will make it the same as `yum upgrade`. (3%)

3. `yum remove` removes specified packages. `yum autoremove` with no packages specified removes packages that weren't installed explicitly (or installed as dependencies) and that are no longer required by other packages. With packages specified, `yum autoremove` first removes those packages, and then remove it's dependencies that are no longer required by other packages. (3%)

4. `yum install <package_name>` (3%)

5. `yum search vim` (3%)

6. `yum provides nfsstats` or `yum whatprovides nfsstats` (3%)

7. `repoquery --requires --recursive --resolve gcc` (3%)

8. Using the CentOS version, we benefit from the extra QA done by the CentOS package maintainer to ensure stability, compatibility and seamless upgrade cycle of a package and that it fits the philosophy or requirement of the distribution in concern. These are crucial for production server and are not straight-forward in the PyPI eco-system. From my point of view, PyPI modules should solely be used in `virtualenv` or user home directories. Morever, `pip` should only be regarded as a convenient way for developers to try out new things quickly and should be prevented as much as possible in production, because PyPI packages are much less QAed. I also warn against the blind use of `sudo pip` because it can potentially damage your system badly. (8%)

9. `pip` and `yum` install `jinja2` into the same directories, which is the cause of warnings you haven seen. Things might get worse when you upgrade the package by `yum`. Such conflict has been described in the Gentoo wiki and heavily discussed on the Fedora mailing list. Now that you have taken the NASA course, stop naively running `sudo pip install xxx` when you get `Permission Denied` on `pip install xxx`. For the intrigued, read the full debate in the `pip` community that attempts to educate their users. (8%)

10. When installing via `gem`, `wikicloth` is uninstallable because 1. the build tools for Native Extension is unavailable; 2. one of its dependency `nokogiri` requires a higher Ruby version than the one in the system. I have to manually install the following packages: `ruby-devel`, `gcc-c++`, `zlib-devel`, `git`, `patch` in order to install `wikicloth` and its dependencies. Quite a pain! `gem` installs it at `/usr/local/share/gems/gems/wikicloth-0.8.3` while `yum` at `/usr/share/gems/gems/wikicloth-0.8.0`. They do not conflict as in the Python one. (8%)