

Chapter 2: Installation of the UEMS

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2.1 Introduction -- Because you have to start somewhere

Installation of the UEMS requires the use of `ems_install.pl`, which is designed to tackle nearly all the challenges you might encounter during the installation of an NWP system. It is highly recommend that you use the most current version of this routine, as your life will become less complicated and more fulfilled if you do. *And that's a statement only a few modeling packages can make!*

So, “Where might I get this `ems_install.pl` utility thing,” you ask?

All NOAA-affiliated current and wannabe users of the UEMS can simply request the routine from the SOO Science and Training Resource Coordinator (SOO STRC). All non-NOAA users, i.e., everyone else, must register for the UEMS on the SOO/STRC site:

<http://strc.comet.ucar.edu/software/uems>

Registration allows users to receive notification of updates as they become available, and also allows the developer to advance his world geography skills when a request from Mauritius is made.

Note that there may be a delay in receiving the `ems_install.pl` utility following your registration, as the information is checked for some semblance of legitimacy and to avoid advertisements for “personal enhancement” products from being sent to others. Once the UEMS concierge is able to confirm your registration, which typically takes between a few minutes to a week should the lone support person be out of the office or comatose, you will receive a second email message with the routine attached. Enjoy!

2.2 System requirements

There are a few system requirements for installing and running the UEMS, which are listed below:

- **A relatively current Linux distribution, but not too current** – The UEMS has been tested on Red Hat Enterprise, Fedora, CentOS, SuSe, and Ubuntu distributions. Other Linux variants will probably work just fine; however, it's simply too difficult to keep up with all the releases and updates. Additionally, there is usually a lag before the developer can install a new distribution for testing, so just stick with what works and we'll both be happier for it.
- **Root permission and/or write permission on a large disc partition.** The `ems_install.pl` routine is designed to be run as root user. You will have the opportunity to assign ownership to another user during the processes. A non-root user can install the system, provided the user has write permission on the drive where the files will reside.
- **The UEMS user must be using a Tcsh or Bash shell** – Anyone using the UEMS must be running a `tcsh` or `bash` shell; otherwise, horrible things may occur, such as a simulation failing to run.
- **150 Gb of available disk space** – This requirement pertains to the installation of the UEMS only. Of course, running an NWP model can use up a significant amount of disk space as you dump simulation data files every minute for 144 hours, so this requirement should be considered as an absolute minimum.
- **A minimum of 8Gb of system memory** – This is just the suggested minimum. Chances are that this amount will need to be increased as you become more empowered with the UEMS. Eventually, all the power will go to your head and you will need your own super computer. Your child's college education fund will just have to wait.

2.3 Installing the UEMS

2.3.1 The basics, or the stuff you must know

You can do a fresh installation whether or not you have an existing UEMS release on your system. The novice user should embrace the most basic of all `ems_install.pl` options:

```
% ems_install.pl --install [release version]
```

As indicated by the [square brackets], the release version is optional since the default is the most current official release. If you are looking to install a previous release, say release "13.14.15", then you must specify the release number as an argument to "**--install**". For example:

```
% ems_install.pl --install 13.14.15
```

The above example is for demonstration purposes only, since release 13.14.15 may not actually exist. So don't try this at home. There is additional information on determining what releases are available in Section 2.5.

2.3.2 What happens during the installation process?

Regardless of what option you choose when installing the UEMS, the process will include the following:

Some preliminary background checking,

- A greeting, just because it's important and you're worth the effort
- A prompt for the installation directory (Default: /usr1)
- A Check to make sure the directory exists and whether you have write permission
- Determine whether an existing UEMS installation resides at that location:
 - Get the version of an existing installation
 - Ask whether you want to rename the existing installation to <uems>.<release>
- A prompt for the name of the user to assign ownership of the package
- An attempt to create a new account and home directory if the user does not exist
- A check that the user's login shell is either tcsh or bash
- A prompt for a password if the new user was created

Finally,

- Install the UEMS from the specified source
- Do the post-install configuration
- Congratulate you on a wise decision

Note that all sorts of useful information will be printed to the screen while the installation is in progress, so don't leave the room, even if you have to go.

During the process, the routine will also attempt to:

- Determine the appropriate run-time executables based on your system architecture.
- Attempt to determine the number of physical CPUs (sockets) and cores per CPU on your machine. Should a problem occur, you will be asked to provide this information and you will be powerless to resist.
- Install an entry (disabled) in the user's crontab file to automate the process of updating the system. You can configure the `ems_install.pl` utility to automatically download and install updates from the EMS servers and notify you of any changes. More on the updating capabilities later once all the bugs are worked out.
- Install an entry (again, disabled) in the user's crontab file to assist in the automation of a real-time forecasting system. The difficult work is already done, as all you need to do is make the appropriate changes to the entry and you'll be off and modeling!

See, isn't that simple? The UEMS practically installs itself, which is just the way you like it.

Note that the downloading of UEMS package files from the EMS servers may require a considerable amount of time, depending upon the speed and reliability of your network connection. So be patient, as your effort will be well rewarded.

2.3.3 Installing from DVD

If you are lucky enough to possess one of the fabulous DVDs from the UEMS collector series, then consider yourself blessed, because life doesn't get any better. Besides being a great coaster, the DVD can actually be used to install the system. This capability does come with a few caveats so don't get overly excited.

Ok, go ahead and jump up and down a little.

In order to install from a DVD, you will need to actually mount the DVD, which may require root privilege on your system. For the sake of this guidance, it is assumed that you have mounted the disc under “/media/cdrom”, although the exact location may differ on your machine. Since you're actually reading these instructions, it's also assumed you can figure out what to do.

Step a. Load UEMS DVD

Step b. Change directories to DVD drive, e.g. “cd /media/cdrom”

At this point you should see a copy of `ems_install.pl` on the DVD. Use this version for installation unless told otherwise by a bowl of fruit or a domesticated farm animal with fur, not feathers. You can't trust the feathered ones.

Step c. Run the `ems_install.pl` routine like you want something good to happen:

```
# ./ems_install.pl --install
```

With any luck something good *will* happen and the installation will begin. However, on some systems you may see an error such as:

```
# ./ems_install.pl
bash: ./ems_install.pl: /usr/bin/perl: bad interpreter: Permission denied
```

Or

```
% ems_install.pl
ems_install.pl: Permission denied.
```

Or

```
% ems_install.pl
ems_install.pl: While you weren't looking I ate your lunch (just kidding)
```

The above errors likely indicate that your DVD is mounted “**noexec**,” meaning you can't run an executable file from the DVD. Silly security restrictions. All is not lost however (other than the time spent interpreting the error message), because a work-around is available:

Step c1. Copy `ems_install.pl` from the DVD to another location such as “/tmp”.

Step c2. Run `ems_install.pl` from that location with the following flags:

```
# ./ems_install.pl --dvd /media/cdrom (or wherever you mounted the DVD)
```

That should solve your UEMS installation-related problems for now.

2.3.4 Installing from the EMS servers

Unless you are installing the UEMS directly from DVD (Section 2.3.3), the default behavior of the utility is to attempt to download the necessary files from data servers at UEMS World Headquarters. There is no need to include any special arguments or flags as everything is built into `ems_install.pl`. Just follow the same basic guidance provided in Section 2.3.1, and most importantly, *think positive thoughts and don't show any fear!* The `ems_install.pl` can sense fear.

2.3.5 Local network installation

If you don't have direct access to the EMS servers, you can still install the system. This method requires that the package tarfiles be manually downloaded and placed in a directory where they are accessible. Remember the system disk space requirements when deciding where to place the files, and then follow these simple steps:

- Step a.** Create a temporary directory where the files are to be downloaded. This can be called anything, provided that you have at least 150Gb of space on that partition. For this example, the directory will be named `"/usr1/repository"`.

```
# mkdir /usr1/repository
```

- Step b.** Open up an EMS server in your browser to view the available full releases:

<http://ems3.comet.ucar.edu/uems/releases>

Index of /<uems>/releases

Name	Last modified	Size	Description
15.9.1/	30-Feb-2015 16:10	-	
15.53.4/	31-Dec-2015 24:11	-	

Determine the release you want to install, which should be the most current one if you know what's good for you. The releases are identified by such silly names as "15.9.1" or "15.53.1," because the UEMS developer was born without an imagination.

- Step c.** Create a directory below `"/usr1/repository"` with the name of the release to be downloaded. For example:

```
# mkdir /usr1/repository/15.53.1
```

- Step d.** Again open up the UEMS site to the desired release

<http://ems1.comet.ucar.edu/uems/releases/15.53.1>

and download all the package tarfiles to `"/usr1/repository/15.53.1"` directory. There may be quite a few files and some are rather large, so while you are waiting you can take up waterfall kayaking or some other worthwhile activity. Trust me, you have time.

Step e. Once all the tarfiles are downloaded and your injuries have healed, run the `ems_install.pl` routine as follows (Replacing the location in the example below with the actual location on your system):

```
# ./ems_install.pl --install --reporid /usr1/repository
```

Step f. Congratulate yourself on another risky yet rewarding skill mastered – the UEMS installation, not the waterfall kayaking.

2.3.6 Making sure your installation was a success

Following the carefree installation, you should *log out and return* as the UEMS user. Make sure your environment is correct by attempting the following commands:

```
% cd $UEMS
```

Wherein you should be located at the top level of the UEMS

Also try:

```
% ls $EMS_STRC
```

Where you should see the contents of the `$UEMS/strc` directory. If both of the above tests are successful, then try running the "**sysinfo**" command provided with your installation (and it IS yours now):

```
% sysinfo
```

You should see a summary of computer system configuration that includes the Linux distribution along with other information such as your blood pressure (just kidding). Please make sure that the following values are correct:

```
Physical CPUs      : # The number of CPUs or mice that you would see if you opened up the  
                      computer case  
Cores per CPU     : # The number of cores on each physical CPU, the stuff you can't see  
Total Processors : # This value should be just Physical CPUs * Cores per CPU
```

If either the number of Physical CPUs or the Cores per CPU is incorrect, you will have to change the values in the `$UEMS/etc/EMS.cshrc` or `$UEMS/etc/EMS.profile` files. If everything appears to be correct, then your installation is complete and you are ready to become a modeler. If not, just give your not-so-local UEMS person a call, or send a message of encouragement along with some baked goods. He needs them both.

The final step in verifying the installation is running a benchmark simulation. Check out Appendix B for the gory details.

2.4 Potentially useful options and flags for every occasion

There are many command-line flags and options that may be passed to the `ems_install.pl` routine. This section attempts to provide some guidance for the available options; however, just like most everything else with the UEMS, the documentation is sometimes lacking since I tend to forget some of the features by the time I write the descriptions. Nonetheless, I can recall enough to impart upon you sufficient knowledge to meet most of your installation wants and desires. *And that's really all you want out of life, isn't it?*

a. **Option:** `--install` `[release version|list|listall]`

When can you use this option: Installing

What this option can and can't do for you:

Passing “`--install`”, without any other options or flags, tells the routine that you want to do a fresh installation of the UEMS. The default is to install the most current release; however, this behavior may be overridden by including a release number as an argument to “`--install`”, in which case the specified release will be used.

Then, when using “`--install`,”

```
% ems_update.pl --install [additional options]
```

Or

```
% ems_update.pl --install <release> [additional options]
```

Alternatively, you can pass “`list`” or “`listall`” as arguments. Including “`list`” will provide a listing of all the available releases on the EMS servers. Using “`listall`” will include a summary of all the individual package files for each available release.

```
% ems_update.pl --install list
```

Or

```
% ems_update.pl --install listall
```

If you request a fresh install but have an existing installation on the system, you have the option of renaming the previous installation (“`uems.<release number>`”) or deleting it from your machine. If you elect to save (rename) the previous installation, any computational domains that reside in the previous “`uems.<release number>/runs`” directory will be transferred to the new “`<uems>/runs`” directory. This default behavior can be nullified by passing the “`--noruns`” flag (see below). If you have domains located elsewhere that you want imported, then you will need to use the “`--import=<dir>`” option.

- b. **Option:** `--emsdir <path to location of UEMS installation>`

When can you use this option: Installing & Updating

What this option can and can't do for you: Hopefully, not much

Include the “**--emsdir**” flag if you want to specify either the location of an existing UEMS installation for updates or the future home of a fresh installation when passing the “**--install**” flag. For the most part, passing this flag is unnecessary; as the `ems_install.pl` routine will figure out most everything it needs and pester you for any additional information. So unless you have a good reason for using it, don't.

- c. **Option:** `--package <character string> --package <character string>`

When can you use this option: Installing

What this option can and can't do for you:

Passing “**--package**” allows you to install or reinstall selected package tarfiles from an EMS server or local repository. This option will only work with an existing UEMS installation; however, you may install a tarfile from a previous release should the voices in your head be telling you to do so.

The argument to “**--package**” is a character string that will be used to match against the tarfiles available on the EMS servers. In the absence of a release number, the string will be used to match tarfile names from the package file list for the installed release. If string matches multiple tarfiles, then all matching files will be downloaded and installed.

You can pass the “**--package**” flag multiple times or you can include list multiple tarfiles separated by a comma (.). Yes, you can even install “update” packages.

For example, if you currently have UEMS V15.9.8 installed, either:

```
% ems_install.pl --install --package mpich2 --package nawips  
Or  
% ems_install.pl --install --package mpich2,nawips
```

will re-install the `mpich2` and `nawips` tarfiles (multiple files) for the V15.9.8 release

You need to include the release number only if you are requesting a tarfile from a release other than the one currently installed on your system. Should you attempt to install a package file from an earlier release, you will be asked to acknowledge a warning message before being allowed to continue. Should you accidentally request the same package from different UEMS releases, most likely due to the excitement and euphoria installation priority will be given to the most current tarfiles. This means that packages from previous releases will be installed prior to those from the current version on the system.

So,

```
% ems_install.pl --install --package release.14.53.0.mpich2.tbz,mpich
```

Will install the mpich2 tarfile from V14.53.0 before the file from installed release (V15.9.8).

So don't just think about it, do it.

d. Option: `--exclude <character string> --exclude <character string>`

When can you use this option: Installing

What this option can and can't do for you:

Passing “**--exclude**” removes tarfile packages from the list of files to be installed. You use this option if you didn't want to install everything the UEMS has to offer and would rather take the “a la carte” approach. This option is typically used when doing a fresh installation and should not be employed with reckless abandon since some packagers have interdependencies that you will find out about at the most critical moments.

The argument to “**--exclude**” is a character string that will be used to match against the tarfiles already selected for installation. If string matches multiple tarfiles, then all matching files will be excluded.

You can pass the “**--exclude**” flag multiple times or you can include list multiple tarfiles separated by a comma (,).

For example, if you were doing an install but didn't want the UEMS source code files:

```
% ems_install.pl --install --package buildsrc
```

Yes, the EMS now includes the source code.

e. Option: `--import =<path to domain directories>[/<domain>]`

When can you use this option: ~~Anytime~~ On hiatus until further notice*

What this option can and can't do for you: * Right now - nothing

The “**--import=<path to domain directories>**” flag allows you to import existing domains from a previous UEMS installation. This option is intended for importing either specific domains from a current \$UEMS/runs directory, or a group of domains within a non-EMS directory (somewhere else on your system).

For example:

```
% ems_update.pl --install --import=/usr1/mysavedfiles/uems/runs
```

will import any computational domains from “/usr1/mysavedfiles/uems/runs” into a new installation. The domains will be localized and updated with new configuration files, retaining the previous configurations *whenever possible*. If you have been living right, all will go as planned and your configuration settings will be preserved. *Beginning to sweat a bit now aren't you?*

If you wish to import only a single domain from a directory containing multiple domains, then simply add the domain name to the end of the string:

```
% ems_update.pl --install --import=/save/uems/runs/bigstorm
```

in which case the “**bigstorm**” computational domain will be imported to “<uems>/runs” and processed following new installation.

You may pass multiple instances of “**--import**” if you have multiple domains to import:

```
% ems_update.pl --install --import=/saved/runs/bigstorm --import=saved/runs/gostormgo
```

Wherein both “**bigstorm**” and “**gostormgo**” domains will be imported into “<uems>/runs” and processed following installation.

If all you wish to do is import computational domains from your current UEMS installation (“<uems>/runs”), then it is not necessary to include the “**--import**” flag as they will be included by default. If you do not want the current domains under “<uems>/runs” to be imported, then pass the “**--noruns**” flag. Including “**--noruns**” has no impact on the “**--import**” flag. The “**--import**” flag is used to import directories moved to a location for safe keeping, which is why you need to include the <path to the domain directories> as an argument; otherwise, the almighty `ems_install.pl` will not have a clue as to what you want and this sentence will become even longer.

Finally, if you are a bit tentative about all this “import” business, you can always wait until after the installation dust has settled and migrate (copy) any existing domain directories to the new location. Then, from each directory run:

```
% ems_domain --localize --update
```

f. **Option:** **--continue**

When can you use this option: Installing

What this option can and can't do for you:

Pass the “**--continue**” flag if you wish to continue the download and installation process from a previously failed attempt. The most likely situation for use of this flag is following a failed internet connection to the EMS servers in which only a partial download was completed.

When the “--continue” flag is passed then `ems_install.pl` will look for the incomplete “uems” installation, which should contain a “releases” directory containing all the previously downloaded tarfiles. Any existing tarfiles will be re-installed and the downloading will continue from the last attempted package tarfile.

If you fail to include the “--continue” flag all is not lost. During the process you will be prompted as how to proceed with the installation and handling of the existing partial installation. At that time you can choose to continue with the previously aborted installation. So the “--continue” flag is not so much a necessity as much as it is a convenience, just like a second thumb on your hand.

g. Option: --nogeog

When can you use this option: Installing

What this option can and can't do for you:

When passing the “--nogeog” flag, you are telling the install routine not to include the large terrestrial data sets. Remember that you actually need these data to run a simulation, but if you already have them locally, you may not want to download them again. You can just copy the files over to the new UEMS installation.

However, there are times when these data change and you may need the updated files. Remember, with the UEMS, stuff just happens. Just don't let it happen to you.

h. Option: --nolocal

When can you use this option: Installing & updating

What this option can and can't do for you:

Passing the “--nolocal” option overrides the default behavior of looking for existing UEMS package files in the “<uems>/updates” or “<uems>/release” directories. Even if package tarfiles exist locally, just look the other way, and download fresh files from a remote location. The old ones smelled funny and were attracting fruit flies anyway.

You would only use this flag if you believed the locally stored tarfiles were corrupted and you didn't feel like deleting them first.

- i. **Option:** `--emshost <ems1|ems2|ems3>`

When can you use this option: Installing & Updating

What this option can and can't do for you:

Including the “**--emshost**” option instructs the installation utility to contact a specific EMS host for information on update and installation packages. The default behavior is to randomly select one of the official EMS servers, but you can request a specific EMS server or different one should there be any.

- j. **Option:** `--noruns`

When can you use this option: Installing

What this option can and can't do for you:

When including the “**--noruns**” flag along with “**--install**”, you are telling the routine **not** to import the computational domains from the existing “<uems>/runs” directory to the new installation, which is the default behavior. Passing “**--noruns**” has **no effect** on the “**--import**” option, so go ahead and use them together, or not at all, with complete reckless abandon. If you pass the “**--noruns**” flag but there is no UEMS on the system, then let me know what happens.

- k. **Option:** `--reldir <path/some directory>`

When can you use this option: Installing

What this option can and can't do for you:

Passing the “**--reldir <path/some directory>**” flag will override the default location where the UEMS release package tarfiles are downloaded. When installing the system, the tarfiles are placed in the “<uems>/release/<release number>” directory unless you pass the “**--reldir <something>**” option. It's best not to use this option unless you have a good reason to change the default directory.

- l. **Option:** `--dvd <path to dvd rom drive>`

When can you use this option: Installing

What this option can and can't do for you:

Use the “**--dvd**” option only if you are installing from a DVD (yes, DVDs are still available for the “Hey you kids, get off my lawn” types). This flag would only be used if you needed to copy the `ems_install.pl` routine from the DVD to another location because you could not mount the drive with executable permission; otherwise, you can ignore this flag. See Section 2.3.3 for guidance on DVD installation.

m. Option: --workshop

When can you use this option: Installing or updating

What this option can and can't do for you:

Passing the “**--workshop**” flag instructs the `ems_install.pl` routine to include any of the classroom exercises available with a new release or update. If you are updating your system and the files were previously installed, then any updates to these files will be automatically included. Conversely, the workshop packages will be excluded during an update if they were not installed previously. You have no control over this fact of life.

The workshop tarfiles are fairly large, so if you don't use them then there is no reason to have them installed.

n. Option: --nounpack

When can you use this option: Installing & Updating

What this option can and can't do for you:

Pass the “**--nounpack**” flag if you do not want to install the downloaded UEMS package tarfiles (the default is to install them), whether for a new installation or an update. Just let them sit in the “`<uems>/release|updates/<release number>`” directory until they've cooled off.

This flag should be named “**--noinstall**”, but I thought that might be confused with the “**--install**” option; however, you can try “**--noinstall**” and see how far it gets you.

o. Option: --curl and --wget

When can you use this option: Installing & Updating

What this option can and can't do for you:

Passing the “**--curl**” or “**--wget**” flag instructs the installation routine to use that utility for http communication to the server(s) guarding the package tarfiles. The default is to use whichever one is available on your system, or randomly select between the two, but you have the option to say otherwise should one method be failing you.

p. Option: --force

When can you use this option: Installing & Updating

What this option can and can't do for you: Quite possibly nothing

Passing the “**--force**” flag will force the installation of an update even though it's already installed. Maybe you messed up and can't figure out where you went so terribly wrong, or maybe you want to take your frustration out on something. I know, I've been there, which is why I included “**--force**” instead of a “**--take_a_deep_breath**” option. Just because it feels better.

The utility of this flag has been diminished with recent updates to `ems_install.pl` and has possibly been rendered useless; however, I keep it in this documentation as a sentimental reminder of simpler Workstation Eta/Workstation WRF/WRF EMS/NEWREMS times.

q. Option: --scour

When can you use this option: Currently none

What this option can and can't do for you:

Passing the “**--scour**” flag will result in any previous UEMS installations being removed from your system. The default behavior, i.e., not passing “**--scour**”, is for the utility to rename any existing installations to “`<uems>.<version>`”, which is probably what you want anyway, at least until you are happy with the new release.

Note that the utility of this flag has been diminished since you will now be prompted as what to do if another UEMS is found during the installation. I'm just too lazy to remove it right now.

r. Option: --reporid <path to release directories>

When can you use this option: Installing & Updating

What this option can and can't do for you:

Use the “**--reporid**” option when you want to grab release or update packages from a local source rather than downloading the tarfiles from the EMS servers. The argument to “**--reporid**” can either be the path to a directory containing one or more UEMS releases or update packages:

```
% ems_domain --update|install [release] --reporid=<path to release directories>
```

The path, `<path to release directories>`, should lead to a directory where the individual release subdirectories are located (`<release>`). These subdirectories should contain all the tarfiles for the UEMS release identified by the directory name (X.Y.Z). For example, on your local system there should exist a directory containing UEMS releases named “`/usr/local/uems/releases`”. Located

beneath “/usr/local/uems/releases” are subdirectories, each containing the package tarfiles for that release or update. The name of each release subdirectory should represent the release number, such as:

```
% ls /usr/local/uems/[releases|updates]
4.54.0 15.9.8 15.47.1
```

Then, when using “--reporid”,

```
% ems_update.pl --install|update --reporid /usr/local/uems/releases|updates
```

The install routine will read the contents of any directories below <path to release directories> and select the most current update (“--update”) or release (“--install”).

In practice, it’s best to maintain a separate release and update repository since updating ones UEMS requires sequential installation of all update tarfiles from the currently installed release to the most recent available.

s. Option: --[no]localize

When can you use this option: Installing & Updating

What this option can and can’t do for you:

Including the “--**[no]localize**” flag specifies whether to re-localize any computational domains under the “<uems>/runs” directory. When importing domains during a fresh installation, *the default is to re-localize each incoming domain*, so passing “--**no**localize” would turn this step off. When updating the UEMS, the *default is to not localize* (“--**no**localize”) the domains so pass the “--**localize**” flag to override this behavior.

Should you chose to not localize but then have a change of heart or come to find that your UEMS (and thus your life) has been ruined by such shortsightedness, you can always update and localize afterwards with the “ems_domain” utility:

```
% ems_domain --update --localize
```

But we are getting chapters ahead of ourselves again.

t. Option: --debug

When can you use this option: Installing & Updating

What this option can and can’t do for you:

Include the “--**debug**” flag if you want `ems_install.pl` to print out all sorts of information about what is going on inside its brain while it’s attempting to figure out what’s going on inside of yours.

2.5 Updating your UEMS with blood and passion, and more blood

Eventually, you will want to update your old, crusty, buggy, and yet well-loved UEMS with a newer and shinier model that contains fresh bugs and that new UEMS smell. When that moment arrives, you can call upon your installation tool (yeah, it's a tool now) to tackle the job. It will someday be known as the Swiss Army knives of installation tools, but for now it's just the leather awl of installation tools.

Just as with the installation processes, the great UEMS unwashed should embrace the most basic of updating commands:

```
% ems_install.pl --update [release version|list|listall] [additional options]
```

Note that the release version is optional, as indicated by the [square brackets], since the default is the most current release. It is recommended that *you not include the update release* and allow the `ems_install.pl` to do its magic. If you have been a slacker and find yourself a few dozen updates behind, no problem, as the `ems_install.pl` will figure out what updates you need to bring your system up to date. With any (a lot of) luck, the utility will download and install each missing update until you are current and just as brilliant as the day you installed your first UEMS. At least that's the plan.

Alternative arguments to “**--update**” are “**list**” and “**listall**.” Passing “**list**” will provide a listing of all the current releases available on the UEMS servers for which you are eligible. Including “**listall**” will include a summary of the individual package files for each release listed by “**list**.”

If you have any domains located in your “`<uems>/runs`” directory, then they will also be updated with new configuration files and your existing configuration settings will be retained (no, really, next time I promise!). At the risk of a complete failure, if you do not wish to update your domains, then include “**--noconf**” flag. The update process does not include a re-localizing the domains under “`<ems>/runs`” by default but may be accomplished by including the “**--localize**” flag.

As you may or may not recall, when you installed the system, an entry was placed in your crontab file that allows you to automatically download and install updates. If you fancy this auto-update feature, then enable the crontab entry by removing the comment, “`#`”, from the command line. If automation makes you nervous, you Luddite, then keep it disabled and fly manually while following the guidance provided.

Listed below is a description of some of the more useful flags and options available during an update of the UEMS. While the options presented in this section are only used during an update, additional options are available for both installations and updates in the section above, so don't miss out.

a. Option: **--allyes**

When can you use this option: Updating

What this option can and can't do for you:

Passing the “**--allyes**” flag tells the `ems_install.pl` routine, “Yes, yes, I love you and trust you completely.” While I have never heard those words myself, here is your chance to say them without the need to verbalize. The only time you will need the “**--allyes**” flag is when doing automated updates, since without

it, the update will hang while waiting for you to respond to some silly rhetorical question.

b. Option: **--noconf**

When can you use this option: Updating

What this option can and can't do for you:

This option is only valid during an UEMS update (“**--update**”) and is ignored when doing a clean installation (“**--install**”).

Include the “**--noconf**” flag if you do not want to update the existing configuration files within each domain directory that exists under “<uems>/runs”. This means that all existing domains will be left untouched during an update and will contain the same configuration files and localization as before. Of course, they may no longer work, but you'll take comfort in knowing that you have some control over your life.

Should you have a change of heart or come to find that your UEMS (and thus your life) has been ruined by such shortsightedness, you can always update and localize afterwards with the “ems_domain” utility:

```
% ems_domain --update --localize
```

But we are getting a few chapters ahead of ourselves.

c. Option: **--upmdir <path/some directory>**

When can you use this option: Updating

What this option can and can't do for you:

Passing the “**--upmdir <path/some directory>**” flag will override the default location where the downloaded UEMS update package files will reside. When updating the system, the package tarfiles are placed in the “<uems>/update/<release number>” directory unless you pass the “**--upmdir**” option. The default is the best option unless you have a good reason to change. You are wonderful just the way you are anyway!