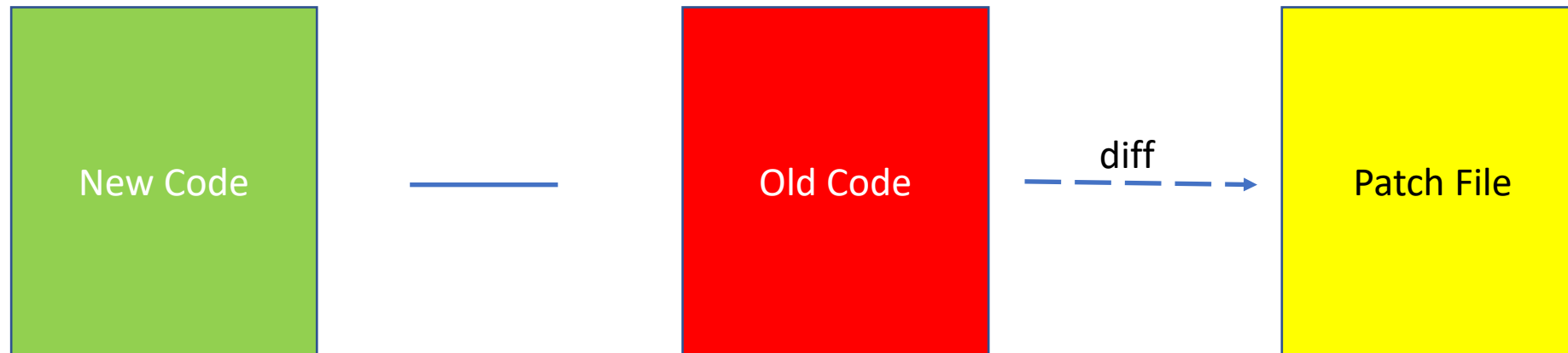# Linux Software Development Tools

By Jitesh Verma
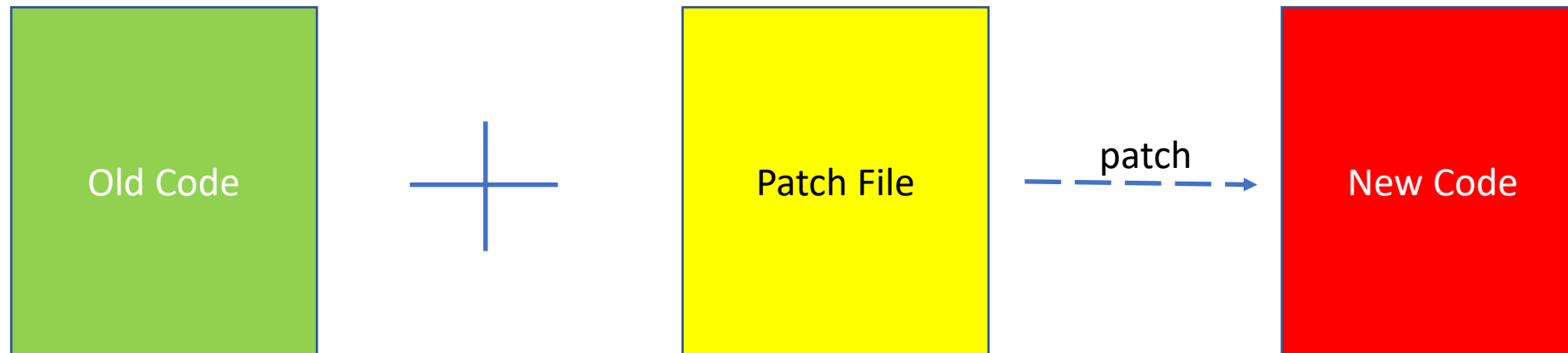
SW Development Tools

- Diff   - Creates patch
- Patch   - Applies a patch
- CScope - Code browsing tool
- Ctags   - Code browsing tool

Patch Creation Process

Patching Process

```
Old Code  +  Patch File  --patch-->  New Code
```

Old Program

```c
#include <stdio.h>
int main()
{
        printf("Hello World\n");
        printf("Bye-Bye\n");
}
```

New Program

```c
#include <stdio.h>
int main(void)
{
        printf("Hello World\n");
        return 0;
}
```

Patch Commands

- Create a patch:

  diff -Naur hello.c hello_new.c > hello.patch

- Apply a patch:

  patch < hello.patch

  OR

  patch –p[patch-level] < hello.patch

  (patch-level: 0,1,2…)

- Dry run (trial) of a patch:

  patch --dry-run < hello.patch

  OR

  patch --dry-run –p[patch-level] < hello.patch

- Removing/Reverting a patch:

  patch –R < hello.patch

  OR

  patch –R –p[patch-level] < hello.patch

Patch File

```
--- hello.c
+++ hello_new.c
@@ -1,7 +1,7 @@
#include <stdio.h>
-int main()
+int main(void)
{
        printf("Hello World\n");
-       printf("Bye-Bye\n");
+       return 0;
}
```

CScope Introduction

- Source code browsing tool
- Creates symbol (string, variable, function etc) data-base of source code
- Used to search symbols in source code
- Works with vi and vim text editors

CScope Commands

- ## Create file-list file:

    find . -name "*" > cscope.files

           OR

    find <dir> -name <file(s)> > cscope.files

- ## Create Source Code Database:

    cscope -b -q -i cscope.files

    (Creates cscope.in.out, cscope.out, cscope.po.out files – do not delete)

- ## Start CScope:

    cscope -d

- ## Stop(Exit) CScope:

    Ctrl-d

CScope Menu

Find this C symbol:

Find this global definition:

Find functions called by this function:

Find functions calling this function:

Find this text string:

Change this text string:

Find this egrep pattern:

Find this file:

Find files #including this file:

CTags Introduction

- Source code browsing/searching tool
- Creates tags (variable, function etc) data-base of source code
- Used to search tags in source code
- Works with vi and vim text editors

CTags Commands

- Change dir to source code dir:

    cd <source-code-dir>

- Create Tags data-base of source code:

    ctags -R *

- Search for a tag (string, variable, function etc):

    vi -t <tag-name>

                OR

    vim -t <tag-name>

References

1) https://www.thegeekstuff.com/2014/12/patch-command-examples/

2) https://cscope.sourceforge.net/large_projects.html

3) https://www.geeksforgeeks.org/ctags-command-in-linux-with-examples/