CW 21-25 Summary

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Contents

1 Flow Chart Details

1.1 Counter Meanings

In the theoretical CSMA and ALOHA files:

Counter 1: Counts received frames.

Counter 2: Counts good frames.

Counter 3: Counts bad frames.

Counter 4: Counts frames that aren't destined to this RX.

Counter 5: Counts frames that are destined to this RX.

2 Organizational

2.1 Device Parameters

Remote PC IP-address: 134.130.223.135
USRPs: 10.0.0.16, 10.0.0.7

2.2 Measurement Plan

For CW 25 the following measurement parameters were commissioned:

- 2 sets of 5 measurements each with a duration of 5 minutes.
- SIFS: $100\mu s$ / $300\mu s$
- DIFS: $500\mu s$ / $1500\mu s$
- Backoff slot: 200 μs / 600 μs
- The results should be plotted with either Matlab or Matplotlib

Note: The DIFS time in 802.11 can be calculated as twice the backoff time plus one SIFS time.

3 GNU Radio Implementation Details

3.1 A Closer Look at PMTs

4 Good to Know...

It has been a good while now, but finally I learned enough feasible stuff to write down.

4.1 Using a static IP address for USRPs

```
#Get to know your interface names
ifconfig
#E.g. set eth0 interface IP to 10.0.0.100/24
#Where up opens the eth0 interface
#and is not necessary if it showed up when using infconfig
ifconfig eth0 10.0.0.100 netmask 255.255.255.0 up

###Just FYI:
#Shutdown network interface
ifconfig eth0 down
##List all interfaces
ifconfig -a
#OR
ip link show
```

4.2 Efficient Remote Control

```
##Opening a remote connection with X forwarding
#Using -X instead of -Y adds security check, but reduces performance
#Use -C to get it more stable (gzip-compression)
#Optional -c aes128-ctr: for AES 128 encryption
#Optional -4: forces the usage of IPv4 addresses
ssh -YC4c aes-128ctr inets@134.130.223.135

##In a second terminal mount file system to local folder
#This has the advantage of the ability to treat files as though they were local
mkdir -p mnt/134.130.223.135
cd mnt/134.130.223.135

#Tip: in the next line for the last argument type . and then expand with Tab :)
#If it is necessary sshfs also allows user-mapping if file ownership is an issue
sshfs inets@134.130.223.135:/home/inets /home/alex/mnt/134.130.223.135/

#Then edit all you like as though the mounted partition was local
cd source/gr-inets/lib
atom *some_file*
```

To further avoid any repetitive commands I added to my launcher tool:

```
"inets")
    if ( mount | grep inets  )
        then
        echo "The mount point is in use, confirm unmount with your password."
        sudo umount /home/alex/mnt/134.130.223.135
    fi
```

```
    echo "Please enter the server password to mount the target directory."
    sshfs inets@134.130.223.135:/home/inets /home/alex/mnt/134.130.223.135
    gnome-terminal --tab -e "bash -c 'ssh -YC4 inets@134.130.223.135'"
    --tab --working-directory=/home/alex/mnt/134.130.223.135
    sleep 1
    exit
;;
```

4.3 Listing Directories Only

Stackoverflow Source

```
##Possibility 1 (fastest):
echo */
#List all subsubfolders as well:
echo */*/

##Possibility 2 (straightforward ls):
ls -d */

##Possibility 3
#where ^ means beginning of a line
ls -l | grep "^d"

##Possibility 4
#If you need to list and process all directories in a bash-script (slow)
for i in $(ls -d */); do echo ${i%%/}; done
```

4.4 Redirecting GRC Stuff to Files

If one wants to do heavy analysis, built-in Linux console tools including, but not limited to utilities such as `awk`, `grep`, `sed`, `cat` might be a great help. Since executing a GRC flowgraph is running a generated python script, we can achieve our goal easily by the simple means of:

```
## Just as a concept
#These could be some lines in my alohaTestSuite.sh
mkdir -p logs
time python2 theoretical_aloha_rx.py &> logs/theoretical_aloha_rx.log
time python2 theoretical_aloha.py &> logs/theoretical_aloha.log
```

4.5 Atom: Folder-Wide Search for Substrings

Use the Ctrl+Shift+F shortcut and all "project folders" will be searched. To add multiple folders use the Ctrl+Shift+A shortcut.