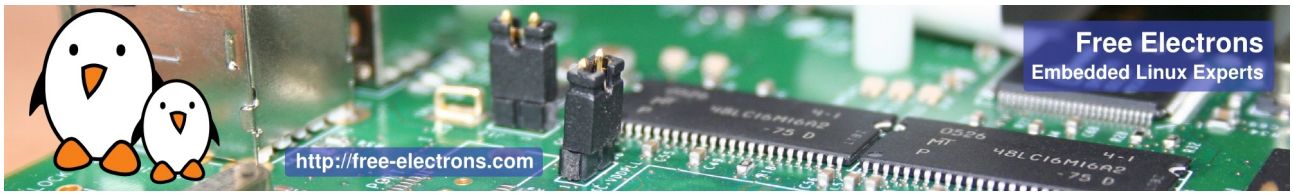


Training evaluation report

Training session: Embedded Linux Kernel and Development Training
Training dates: Nov. 15-19, 2010 (5 days)
Country: France

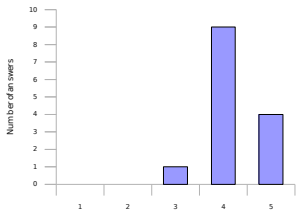
Number of participants: 17
Returned evaluation forms: 14

Thank you for having organized a Free Electrons training session!
Here is a wrap-up of evaluations from participants.

Learning objectives

1. How well did the course meet your learning objectives?

Rating	Answers	Description
1	0	Not met
2	0	
3	1	
4	9	
5	4	Fully met



4 – May be look for two different kinds of drivers (I2C, USB, ...) ; a practical lab on a DMA implementation

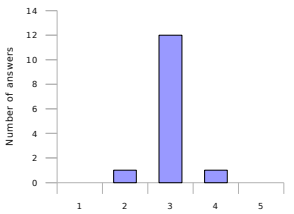
4 – The audience expectations were various ; the participant's levels of knowledge were different.

3 – Good practical labs but maybe lacking pre-written code, which would avoid wasting time on non essential aspects (for example, the serial RX lab, adding op functions – startup, shutdown, to avoid aborts at probe time...). Theoretical part a bit too quick, we can easily lose ground.

4 – Exhaustive; May be differences between kernel development rules/specificities and user space rules should be highlighted.

2. How was the duration of the course?

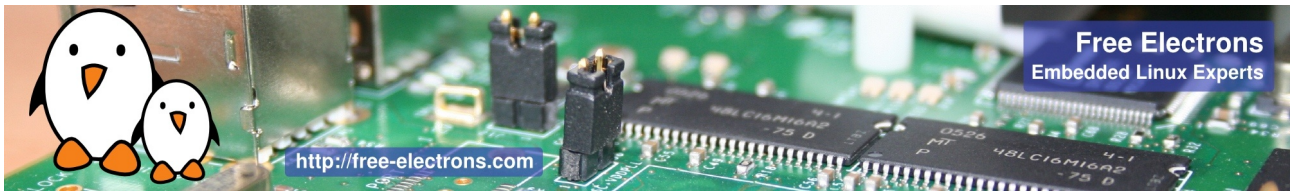
Rating	Answers	Description
1	0	Too short. Couldn't learn enough in such a short time.
2	1	A little too short
3	12	Just fine
4	1	A little too long
5	0	Definitely too long. The concepts could be learned in much less time.



3 – Practical labs were very good, but the last one on serial driver was a little bit too long and doesn't add much value after the driver registration.

2 – We could have saved some time with faster Internet connection.

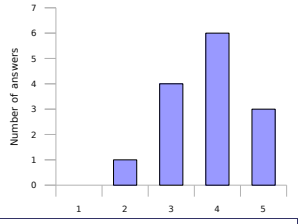
3 – Theoretical part a little bit too fast. We can get lost.



Lecture materials

3. How helpful were the lecture materials?

Rating	Answers	Description
1	0	Not helpful. Made things more difficult to learn and understand.
2	1	
3	4	
4	6	
5	3	Really made things easier to understand and learn.



4 – In my humble opinion, deeper kernel mechanism presentation missing, eg, memory management, scheduling...

3 – Practical trainings are ok. Sometimes, training presentations would require more schematics, diagrams, flow charts to understand the interactions between the different modules.

3 – Some schematics or sequence diagrams are missing to better understand the interactions between the different modules.

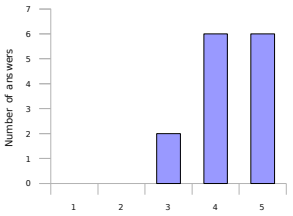
4 – Very useful and we can re-use it.

2 – Missing some explanations in some slides (software code without comments).

3 – The introduction to some concepts sometimes lack some illustrations before implementation/prototyping details.

4. Will you recommend these materials to others?

Rating	Answers	Description
1	0	No. Not helpful without following the sessions.
2	0	
3	2	
4	6	
5	6	Definitely

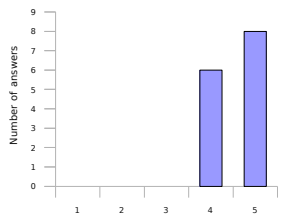


4 – Good helper

3 – Very helpful for someone who already knows the concepts of Linux.

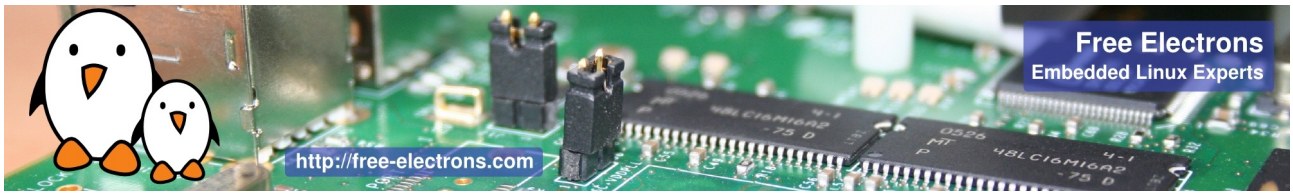
5. If you have Linux project opportunities, will you use these materials again?

Rating	Answers	Description
1	0	No. I will look for other sources of information.
2	0	
3	0	
4	6	
5	8	Definitely



4 – Other source of information is needed

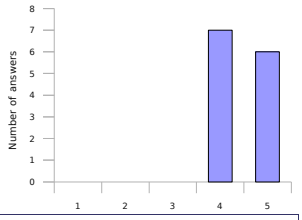
5 – If the development is close to the course, I will re-use it surely.



Instructor added value

6. How knowledgeable was the instructor?

Rating	Answers	Description
1	0	Not enough for my own technical experience.
2	0	
3	0	
4	7	
5	6	More than enough for my own experience.



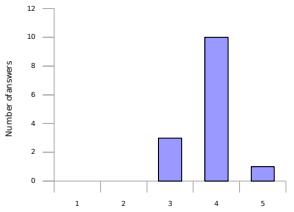
N/A – Good Linux knowledge. On the practical labs, may be give hints about usual traps teams can fall into

5 – Sometimes my knowledge was a little poor for the course...

5 – Very skilled instructor.

7. Did instructor oral explanations add value to the lecture materials?

Rating	Answers	Description
1	0	No added value to reading the materials.
2	0	
3	3	
4	10	
5	1	Yes. The instructor really made very useful oral explanations.



3 – DMA part could have been more detailed through basic examples

3 – Don't hesitate to speak louder! Lack of self-assurance maybe. Tends to mutter under his breath when the slide contents are not fully appropriate, or when he his not very familiar with the contents.

4 – Good in general. A little bit too fast on certain parts.

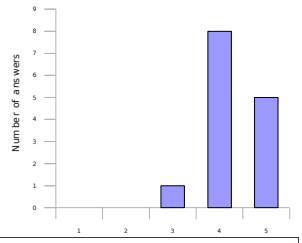
4 – I think that if training materials were more “interactive”(flow charts, diagrams), it would help the instructor to really explain the interactions. I also think that trainer should better introduce chapters (context, examples...).

4 – The cover of the course material is a little too fast (but I will re-read the material...).

4 – Oral explanations could be made less “neutral” to highlight most important ones.

8. How well did the instructor answer questions from the audience?

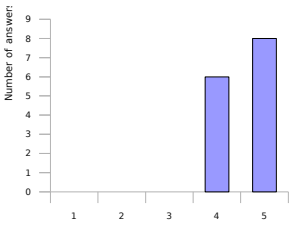
Rating	Answers	Description
1	0	Poorly. Didn't try to understand the questions well or rarely managed to find useful answers.
2	0	
3	1	
4	8	
5	5	Answered very well to questions from the audience



5 – Really good knowledge of Linux kernel source code.

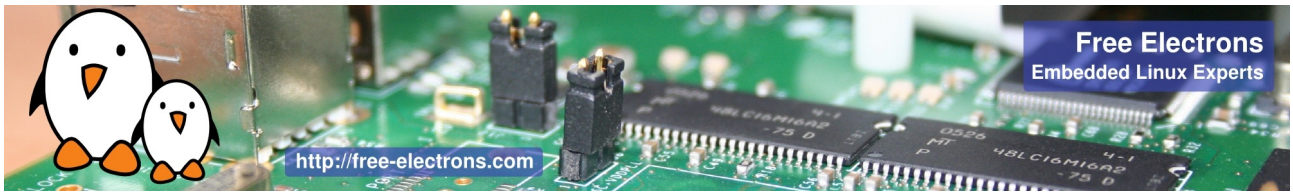
9. Was the instructor helpful with practical labs?

Rating	Answers	Description
1	0	No, not enough available and helpful during the labs.
2	0	
3	0	
4	6	
5	8	Yes. The instructor definitely helped to make labs a learning opportunity.



4 – The lab material should be even more detailed to help the trainee, in particular during serial driver development.
Free Electrons comment: it's on purpose that our labs are not very explicit. In order to let participants learn by finding solutions by themselves (all the details we don't give are in the lectures), we tell people what to do, but not how to do it. But of course, some instructions can be improved to make them clearer and explain better why things are done the way they are.

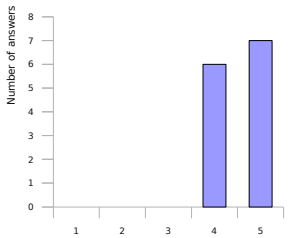
5 – Yes, practical labs helped to understand theory.



Training labs

10. How useful were the training labs?

Rating	Answers	Description
1	0	Not useful. Didn't add significant value to the lectures.
2	0	
3	0	
4	6	
5	7	Very useful. Helped to highlight things not understood and build useful experience.



4 – Some technical details in drivers are to much “copy paste” and I am not sure if it is really important to take time for this. My focus was to understand the driver architecture (not driver serial details).

5 – Training labs very well prepared.

N/A – Ok, interesting but some practical labs (serial) for which we create a driver from scratch are too long

5 – Labs are essential.

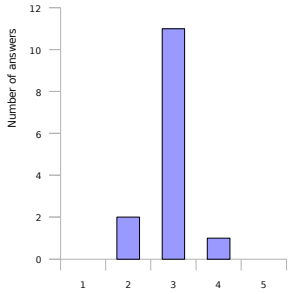
5 – Missing information about register size etc.., about serial driver design.
Free Electrons note: we documented the register size in our labs. Thanks!

4 – It should be useful to have the .c skeletons.

5 – Very very useful. Thanks.

11. How difficult were the training labs?

Rating	Answers	Description
1	0	Too difficult. Didn't help or even discouraged a beginner to get more familiar with the tools and concepts.
2	2	A bit too difficult. Would be better if the lab instructions gave a bit more details about explanations.
3	11	Just fine. Prompted me to look for answers, get my own experience and find my own solutions.
4	1	Too easy for my own technical level.
5	0	Too easy for everyone. Should challenge participants more and help everyone to practice on real issues.



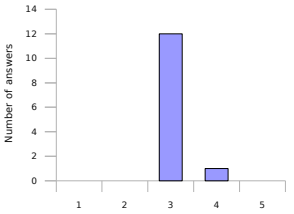
3 – May be some skeleton piece of code should help to go faster (ex : basic low level code for UART driver).

2 – Rather difficult

2 – Some details should be given regarding serial driver development.

12. Was enough time dedicated to the practical labs?

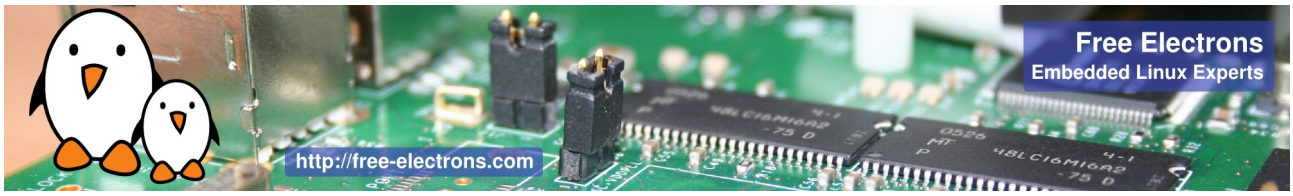
Rating	Answers	Description
1	0	No. More practice is needed
2	0	A little bit more time would help.
3	12	Just fine
4	1	A little bit less time would be enough.
5	0	Don't need to spend so much time on labs. On-the-job practice is best



3 – See comments on question 2

4 – Yes, even too much

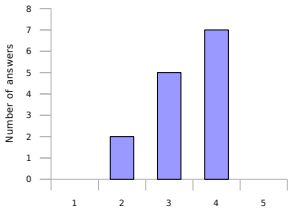
N/A – Depends on the number of issues/bugs found during the labs.



Training conditions

13. How do you rate training conditions (room size, equipment, environment...)?

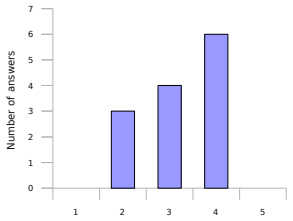
Rating	Answers	Description
1	0	Poor.
2	2	
3	5	
4	7	
5	0	Very good.



3 – We were too many trainees at the same time
3 – Not enough space on the workplace ; reception ok.
3 – Not enough space compared to the number of trainees.
3 – Slow network
4 – A little warm in the room.
2 – Problems with computers (BIOS battery).
2 – Room size, network speed

14. How do you rate the training equipment (mainly computers)?

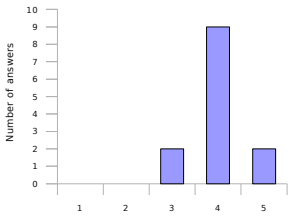
Rating	Answers	Description
1	0	Poor. Not powerful enough to execute practical labs.
2	3	
3	4	
4	6	
5	0	Very good. Very little time waiting, more time learning.



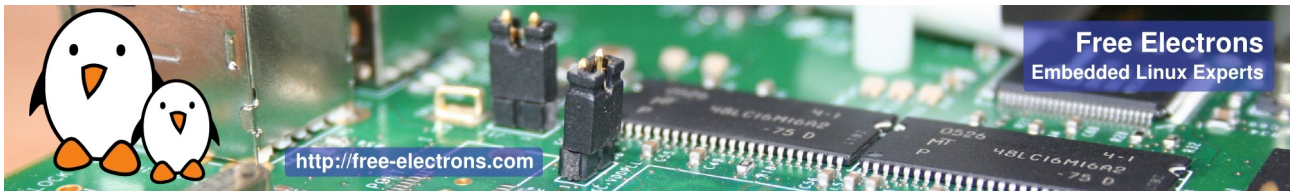
2 – It would have been better to have Ubuntu already installed
Free Electrons note: Ubuntu was installed, but it was the server edition instead of the desktop one. We improved our instructions to reduce the risk of mistakes from IT people preparing the computers.
3 – Slow download
N/A – Issue with mine to run Linux
4 – Difficult to install Linux on the desktop ; laptop was ok.
2 – See comments on question 13.

15. How well was the course organized (program, registration, meeting the schedule...)?

Rating	Answers	Description
1	0	Not well
2	0	
3	2	
4	9	
5	2	Very well



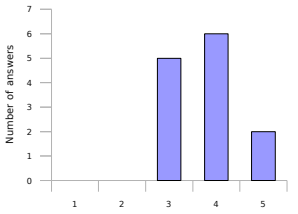
N/A – OK
3 – Ubuntu installation wasn't very interesting. I think training should start by kernel compilation (not installation from CD).
Free Electrons comments: again, the distribution should have been installed ahead of time.



Overall rating

16. How much did you learn?

Rating	Answers	Description
1	0	Definitely not much
2	0	
3	5	
4	6	
5	2	Definitely more than I expected.



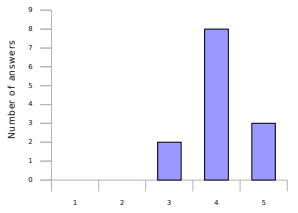
3 – I'm not sure I have enough feedback to respond to this question.

3 – Ok but schematics are missing

4 – I already done some Linux developments. I already knew some subjects but the training provided useful clarifications on other parts.

17. How useful will this course be in your daily job?

Rating	Answers	Description
1	0	Not useful.
2	0	
3	2	
4	8	
5	3	Very useful. Will make my job easier and more productive.

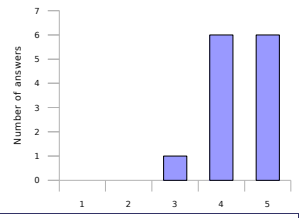


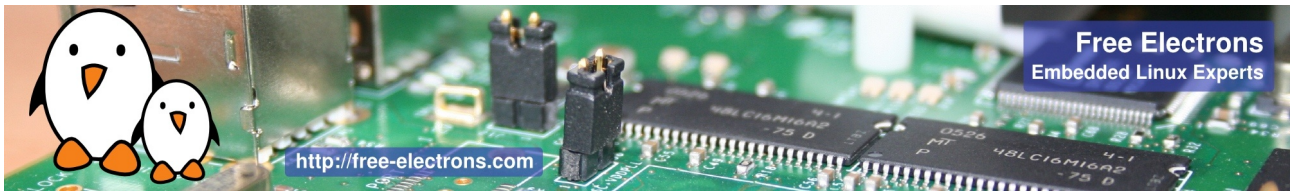
5 – Especially kernel porting part, labs in which we implement a driver.

4 – To be confirmed, depending of my coming tasks.

18. Would you recommend this course to others?

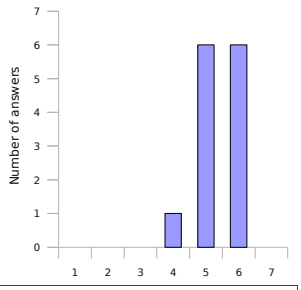
Rating	Answers	Description
1	0	No.
2	0	
3	1	
4	6	
5	6	Yes, definitely





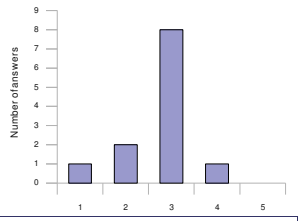
19. Overall rating

Rating	Answers	Description
1	0	Very disappointing
2	0	Disappointing
3	0	A little bit disappointing
4	1	OK
5	6	Pretty good
6	6	Very good
7	0	Excellent



20. An extra session?

Rating	Answers	Description
1	1	No
2	2	
3	8	Why not?
4	1	
5	0	Yes, definitely



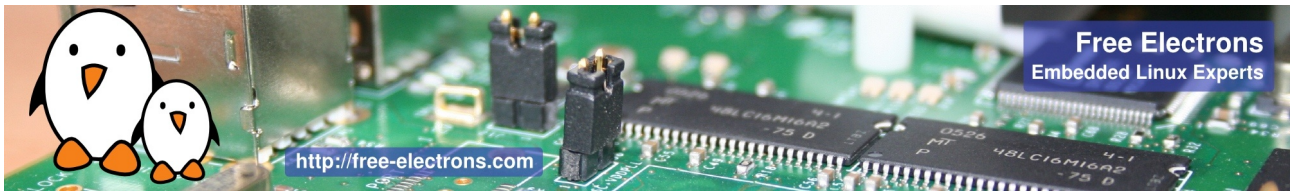
Number of votes for topics in an extra session

Understanding the Linux kernel		Linux device driver development		Linux board support packages		Embedded system development		Miscellaneous needs	
Process management		USB device drivers	4	Processor specific code		Lightweight tools	1	Java	
Filesystem implementation	1	USB host drivers	4	Board specific code		Embedded system development tools	1	Real-time	
Memory management		PCI drivers	2	Board specific interrupt support code		Cross-compiling toolchains	1	Audio	
Scheduling implementation		Network drivers	3	DMA support	2	Debugging solutions	1	Video	
Bootstrap code		Block drivers	2	Bootloader development		Software development tools	1	uClinux	
		Flash drivers	1			Programming with graphical libraries	1	Voice over IP	1
		I2S drivers	3			POSIX API	1	Power Management	2
		Input drivers	2			System optimization	1		
		Sound drivers	2			Root filesystem creation	1		
		Video drivers	1						

Free Electrons comments

Thanks to the (sometimes oral) suggestions from the audience, we will improve future training sessions...

- By adding more graphics and diagrams to our course, by adding more context information, to make things easier to understand.
- By improving our serial lab, to focus mainly on practicing with the generic kernel framework, and providing ready-made code for the parts which are hardware and serial framework specific.
- By doing our best to have Linux installed ahead of time, when possible, and with the right version (we already made our instructions even more mistake proof).
- The instructor will make efforts to speak louder.



Life after training

After this training session, do not hesitate to get back to us! Here are things we could do to support you in your embedded Linux projects:

- More training: you may be interested in the other training sessions that we propose, either embedded Linux system development or Linux kernel and driver development, depending on the course you have already taken. See http://free-electrons.com/training for details.
- If some people in your organization missed the session, and you don't have enough requests to organize another session, they can choose to go to our public training sessions. See http://free-electrons.com/training/sessions for details.
- Linux kernel porting. Adding Linux support to your boards, or supporting you in doing this.
- Having your board support code merged in mainstream sources (Linux, U-boot), so that your sources are maintained by the community. This also means for customers that your boards will be supported for a long time.
- System development and integration. Creating demos and prototypes.
- System optimization: improving system performance and features (power consumption, speed, size...)
- Investigating and fixing nasty bugs that you don't have time to cope with by yourselves.

See http://free-electrons.com/services for details.