

LittleFe/BCCD Project

Report on the SC13 LittleFe Buildout Survey

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Introduction

The LittleFe/BCCD group received support from NSF grants 1258604 and 1347089 to host “Buildout” sessions as part of the HPC Educators Program at the Supercomputing Conferences SC12 and SC13. Buildout sessions are one-, two-, or three-day activities where teams, each with faculty members and possibly their students from colleges and universities across the United States, spend the allotted time assembling their LittleFe cluster, installing the Bootable Cluster CD (BCCD) Linux distribution, and learning how to use and develop curriculum modules for the LittleFe/BCCD platform. NSF grant 1258604 also provided a modest amount of support to evaluate the success of the LittleFe Buildout sessions.

The project evaluation has two overall goals: (1) to assess the quality of the LittleFe/BCCD platform as a tool for teaching and learning parallel/distributed computing and computational science in general; and (2) to understand how we can improve the platform and make it more available and accessible to a broader audience. Because of time and budget constraints of the project, the main tools used for completing the project evaluation were online surveys. One set of surveys targeted faculty and students who participated in the SC12 and SC13 LittleFe Buildouts and who took the units they assembled back to their home institutions. A separate evaluation survey addressed the use of LittleFe/BCCD at those institutions, which includes the creation of new curriculum modules for the LittleFe/BCCD platform. This latter survey also targeted participants of other LittleFe Buildout events besides those at SC12 and SC13. Parallel with the surveys, the LittleFe/BCCD team collected reports from Buildout participants via Google Forms on their publication and outreach activities that involved the LittleFe/BCCD units.

This brief report summarizes the results from the SC13 LittleFe Buildout survey. Other reports discuss the results of the SC12 LittleFe Buildout Survey [1] and the LittleFe Evaluation Survey [2]. In this report, we first discuss the development of the surveys and the methodology through which they were deployed. The next section summarizes both the quantitative and qualitative results and offers some brief conclusions. The final section discusses next steps in the project evaluation. The Appendices contain the survey instrument itself along with tables of qualitative survey data.

Methods

The SC13 LittleFe Buildout [3] was a three-day workshop held on November 17-19, 2013, as part of the SC13 conference in Denver [4]. Of the 17 participants who registered for the event, only 1 did not attend. All workshop participants were entitled to keep the LittleFe cluster that they assembled during the workshop. During the first workshop day, the participants built their LittleFe unit. During the second workshop day, the participants installed the BCCD. During the third workshop day, the participants learned about curriculum module development, which included presentations from past Buildout participants, who demonstrated curriculum modules they had developed for the LittleFe/BCCD platform.

Creating the LittleFe Buildout Survey

Prior to the SC12 LittleFe Buildout, the LittleFe/BCCD group leaders met with an external project evaluator to discuss the LittleFe Buildout survey structure, and shortly after the workshop was conducted, the survey was completed. This survey was re-used for the SC13 Buildout workshop. The survey is comprised of 25 multiple-choice and free-text response questions divided into 4 sections, which address demographics and background information, experiences assembling LittleFe/BCCD, experiences using LittleFe/BCCD and suggestions for improving LittleFe/BCCD training and outreach strategies. The survey questions were beta-tested and refined to ensure participants could easily complete the survey within 30 minutes. (See Appendix I for a complete list of all survey question pages).

Deploying the LittleFe Buildout Survey

The LittleFe Buildout survey was implemented using a web-based survey tool provided by the National Computational Science Institute (NCSI). The survey was administered on the last day of the SC13 Buildout, November 19, 2013. Email reminders to take the survey were sent on December 2, 2013, December 20, 2013, and February 8, 2013. The results were analyzed in December 2014.

Results

Of the 16 workshop participants, 13 finished the online survey. This represents an 81% completion rate.

I. Background and Demographics

Table 1 through Table 4 summarize the demographic characteristics of participants for the SC13 Buildout survey. A relatively small percentage of the participants were female (3/13 or 23%). Similarly, a relatively small percentage were non-white (4/13 or 30%).

Gender	
Female	3
Male	10

Table 1. Gender of LittleFe Buildout Participants

Ethnicity	
White, non-Hispanic	9
Black, non-Hispanic	1
Asian	2
Hispanic	1
Native Hawaiian or Pacific Islander	0
American Indian or Alaskan Native	0
More than 1 Race : non-Hispanic	0
More than 1 Race : Hispanic	0

Table 2. Ethnicity of LittleFe Buildout Participants

Table 3 shows that most of the SC13 workshop participants were faculty at 4-year colleges, although instructors at 2-year colleges, faculty from Ph.D.-granting institutions, and university students were also represented. Others were either faculty at M.S.-granting institutions or school administrators.

Institution Type	
K-12, Pre-college	0
2-year college	1
4-year undergraduate	7
Ph.D. granting	1
I do not teach (I am currently a student)	1
Other	3

Table 3. Institution Type of LittleFe Buildout Participants

Table 4 shows that the workshop attracted teachers with a variety of experience. The same number of participants are found in each of the categories for 0-5, 6-10, 11-15, and greater than 20 years of experience.

Years Teaching	
0 - 5	3
6 - 10	3
11 - 15	3
16 - 20	0
greater than 20	3

Table 4. Years Teaching of LittleFe Buildout Participants

II. Experiences Learning and Assembling LittleFe/BCCD

Table 5 summarizes the opinions of participants about assembling the LittleFe/BCCD unit during the workshop. Responses were very positive overall, particularly with regard to the helpfulness of the Buildout instructors. Responses about the assembly instructions were slightly less positive, which is supported by the fact that there were more participants who had issues with the Buildout kit than those who did not (see Table 6). This is also supported by some of the responses to short answer questions.

	Strongly Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	N/A	N
The organization of the assembly instructions was good.	7	3	2	0	1	0	13
The content of the assembly instructions was clear.	5	6	1	0	1	0	13
The Buildout leaders were helpful and/or useful.	12	1	0	0	0	0	13
We were able to complete the build in the allotted time.	13	0	0	0	0	0	13

Table 5. Experiences Assembling LittleFe/BCCD

	Missing Parts	Damaged Parts	Mislabeled Parts	No problems with the assembly kit	Other	N
Were there problems with the quality of your LittleFe assembly kit?	1	3	0	5	4	13

Table 6. Problems with the LittleFe/BCCD assembly kit

Short-Answer Question Responses.

For each free-text short-answer question, all responses by participants were reviewed and the main themes or suggestions were summarized. The summaries are listed and discussed below; a full compilation of all responses to short-answer questions can be found in Appendix II.

Responses to the first question (A, see the text box in the right margin) were consistent with quantitative ratings given to the organization of the assembly instructions; the main constructive suggestions for improvements are given in the adjacent text box. Overall, participants felt that the instructions were organized but some noted that some instructions were too vague, in the wrong order, or outdated (the instructions in this Buildout having been based on instructions for previous Buildouts, some of which were written for earlier hardware versions). A few responses indicated that the instructions were less helpful than the physical, completed example LittleFe unit, which was available as a reference to the participants during the event.

Responses to the question on content (B, see the text box in the right margin) were very similar to the replies about the organization of the instructions. Multiple responses indicated that instructions could be more specific, and that a clearer order of instructions should be established. Again, multiple participants responded that the physical, completed LittleFe unit was valuable in tandem with the instructions.

Participants had very positive experiences with the workshop leaders and assistants and voiced few complaints about them or their presentations (C).

More than half of the participants (8/13) voiced complaints about the LittleFe kit (D). The most common concerns were about a relative scarcity of screwdrivers and

A. What could be done to improve the organization of the assembling instructions?

- Update them to match the hardware used
- Fix the order of instructions
- Make steps less vague and more comprehensive
- Provide more troubleshooting guidance

B. What could be done to improve the organization of the assembling instructions?

- Have labelled photos of each of the pieces and each of the steps
- Provide video instructions
- Have an IKEA-like set of instructions
- Emphasize the order of steps
- Provide handouts of the instructions
- Label the parts in the kit
- Clearly distinguish parts that look the same

C. What could be done to improve the helpfulness/usefulness of the Buildout leaders?

- Be consistent with training instructions and tips
- Have more tools available

D. Were there problems with the quality of your LittleFe assembly kit? If so, what?

- Not enough screwdrivers
- Wi-Fi did not work
- One of the boards did not boot
- A few screws were missing

non-functioning Wi-Fi.

III. Experiences Using LittleFe/BCCD

On day 3 of the workshop, participants learned about the possible uses of their units through presentations from past Buildout participants, each of whom had developed one or more curriculum modules for LittleFe/BCCD. Table 7 summarizes participants' impressions of this day. As with the assembly, participants were generally very positive and uniform about their experiences; only 1 participant was neutral about whether the demonstrations and examples were useful. Understanding the potential value of LittleFe in their courses was not the only benefit that most participants gained from the workshop. A high percentage of respondents (9/12, or roughly 75%) also felt they would continue to stay in touch with workshop participants and others in the growing community of HPC educators. The other three respondents were merely neutral about the possibility of networking. One participant exempted him/herself from the question without providing a reason.

	Strongly Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	N/A	N
The event examples and demonstrations of High Performance Computing (HPC), Parallel Programming, and Computational/ Data Enabled Science and Engineering were interesting and useful.	8	4	1	0	0	0	13
I met others with whom I plan to continue networking after the LittleFe/BCCD buildout event is over.	5	4	3	0	0	1	12

Table 7. Experiences using LittleFe/BCCD

Short-Answer Question Responses.

The short-answers to survey questions about experiences using LittleFe shed light on the reasons some of the participants might not have found the examples and demonstrations useful, and more importantly, they offer constructive suggestions for improvements.

In response to the first question (E, see the text box in the right margin), multiple participants remarked that examples should be easy to follow regardless of background or experience. There were comments that generally suggested participants would like the examples to be more comprehensive, standardized, and helpful for building a community of educators.

In response to the second question (F, see the text box in the right margin),

E. What could be done to improve the usefulness of the examples and demonstrations?

- Implement a centralized repository of curriculum modules with detailed instructions on creating them
- Have more concrete examples for a variety of teaching settings and courses
- List learning objectives and expected background for each activity

participants were very positive but also offered a few constructive suggestions. One participant reiterated that Buildout leaders should be more consistent with their training instructions and tips.

In response to the third question (G), many participants provided no additional suggestions for examples or demonstrations. Multiple participants mentioned software performance analysis among the examples, and use of GPUs was mentioned multiple times as well. Other participants wanted to focus more on aspects of integrating LittleFe into the curriculum at different levels.

In response to the fourth question (H), a variety of suggestions were provided, many of which seemed geared towards motivating and improving the experience of beginner students.

In response to the fifth question (I), the most commonly mentioned suggestion was to provide sufficient amounts of tools during the hardware assembly. In general, the comments seem to suggest that a shorter Buildout focused more on curriculum and less on hardware assembly would be beneficial.

In response to the sixth question (J), participants seemed very optimistic about the community they were joining and generally recommended ways to expand this community.

- Discuss successes and challenges seen in actual teaching use
- Have participants bring examples to share ideas
- Give more practice time with software

F. What could be done to improve the quality of the Buildout leader's presentations of examples and demonstrations?

- Create videos about common problems beginners experience with LittleFe
- Make examples easy to follow regardless of background or experience
- Be consistent with training instructions and tips

G. What other kinds of examples or demonstrations could be presented?

- Speedup and scaling examples with both OpenMP and MPI
- Simple CUDA examples
- A couple of simple MPI problems
- How to sequence curriculum for different course styles
- Research work done on LittleFe
- How to introduce concepts in a CS/1 course

H. In addition to demonstrations and examples, what different ways of showing teaching uses of LittleFe/BCCD could be considered?

- Other subjects besides computer science
- YouTube videos
- Setting up job scheduling on LittleFe
- Uses in student-directed research
- Quick and simple example of OpenMP or MPI
- Outreach examples

I. What additional comments do you have on the LittleFe/BCCD Buildout or how to improve it?

- Have a complete set of tools available for each team during the hardware assembly
- Use 2 days instead of 3 days, with day 2 focused on curriculum
- Be more clear about the event schedule so participants can plan to participate in other parts of the conference
- Provide YouTube videos to help participants in the Buildout and showcase how different programs use the LittleFe in classes
- Provide functionality to make it easier to boot up LittleFe nodes
- Open up training to middle school students

J. What additional comments do you have on ways other than workshops to train faculty, instructors and students on the use of LittleFe/BCCD in teaching?

- Have parts manuals available to troubleshoot problems when they arise
- Provide an email list or forum for discussions
- Provide more hands-on training time
- Provide the device driver for the Wi-Fi
- Emphasize the modules that are already available
- Keep the LittleFe.net website up to date with events and links to curriculum materials
- Provide grants to allow the Buildout participants to become instructors of other Buildout events
- Provide site visits to places where LittleFe is put to good use

Conclusions and Recommendations

The LittleFe/BCCD Buildout workshop at SC13 was generally regarded by participants as very successful, and participants suggested a number of ways it could be improved for future conferences. The most oft-made suggestions were that more tools should be provided and assembly instructions should be clearer, which would allow the hardware portion to be completed more quickly, and that more time should be spent on the curriculum portion, so that participants have clearer ideas of how to use LittleFe/BCCD in their classes and collaborate with their fellow LittleFe/BCCD owners. The participants were generally very pleased with the Buildout experience, and the LittleFe team should consider implementing as many of their suggested ideas as practical for future Buildout workshops.

References

- [1] Report on the SC12 LittleFe Buildout Survey.
http://littlefe.net/files/LittleFe_SC12_Buildout_Survey_Report.pdf

- [2] Report on the LittleFe Evaluation Survey.
http://littlefe.net/files/LittleFe_Evaluation_Survey_Report.pdf

- [3] SC13 LittleFe Buildout. <http://sc13.supercomputing.org/content/littlefe-buildout-0>

- [4] SC13 Conference. <http://sc13.supercomputing.org/>

Appendix I: Survey Questions

The following screenshots show all questions from the survey as they appeared to participants.

2013 LittleFe Buildout Event Survey

Shodor > NCSI > 2013 Workshops > LittleFe Buildout Event > Surveys > 2013 LittleFe Buildout Event Survey

The main goal of the first set of evaluation questions will be to understand what you thought of the event: whether it met your expectations or not, what you learned, and what you may have wanted to do or learn but did not. We would like you to complete this survey within a week or two of the workshop.

I. Background information

Which LittleFe Buildout event did you attend? *

What is your gender?

What is your ethnicity?

Where do you teach? *

If 'other', please explain:

If you are a teacher or faculty member, how long have you been teaching?

Have you ever attended an SC Education Program/HPC Educators Program before? *

If yes, which ones?

- | | | |
|--|-------------------------------|-------------------------------|
| <input type="checkbox"/> Prior to 2005 | <input type="checkbox"/> 2007 | <input type="checkbox"/> 2010 |
| <input type="checkbox"/> 2005 | <input type="checkbox"/> 2008 | <input type="checkbox"/> 2011 |
| <input type="checkbox"/> 2006 | <input type="checkbox"/> 2009 | <input type="checkbox"/> 2012 |

[Select All](#) - [Select None](#)

II. Experiences Learning and Assembling LittleFe/BCCD

Please rate the following statements on your experiences assembling your LittleFe/BCCD unit at the event.

	Strongly Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	NA
The organization of the assembly instructions was good.	<input type="radio"/> *					
The content of the assembly instructions was clear.	<input type="radio"/> *					
The Buildout leaders were helpful and/or useful.	<input type="radio"/> *					
We were able to complete the build in the allotted time.	<input type="radio"/> *					

[Select None](#)

What could be done to improve the organization of the assembly instructions? *

What could be done to improve the content of the assembly instructions? *

What could be done to improve the helpfulness/usefulness of the Buildout leaders? *

Were there problems with the quality of your LittleFe assembly kit? *

Please check all that all apply.

Missing Parts

Damaged Parts

Mislabeled Parts

No problems with the assembly kit

Other

[Select All](#) - [Select None](#)

If 'other', please explain:

III. Experiences using LittleFe/BCCD

Please rate the following statements on your learning to use your LittleFe/BCCD unit at the event.

	Strongly Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	NA	
The event examples and demonstrations of High Performance Computing (HPC), Parallel Programming, and Computational/Data Enabled Science and Engineering were interesting and useful.	<input type="radio"/>	*					
I met others with whom I plan to continue networking after the LittleFe/BCCD buildout event is over.	<input type="radio"/>	*					

[Select None](#)

What could be done to improve the usefulness of the examples and demonstrations? *

What could be done to improve the quality of the Buildout leader's presentations of examples and demonstrations? *

What other kinds of examples or demonstrations could be presented? *

In addition to demonstrations and examples, what different ways of showing teaching uses of LittleFe/BCCD could be considered? *

IV. Suggestions for improvements to LittleFe/BCCD training and outreach strategies

What additional comments do you have on the LittleFe/BCCD Buildout or how to improve it? *

What additional comments do you have on ways other than workshops to train faculty, instructors and students on the use of LittleFe/BCCD in teaching? *

Appendix II: Participant Responses to Short-Answer Questions

Following are complete records of all participant responses to short-answer questions in the order in which the questions appeared. Section headings of the questions are included. The responses are shown in association with the corresponding ratings from the previous questions from the same participants to give a broad sense of the consistency across quantitative scoring and qualitative comments.

II. Experiences Learning and Assembling LittleFe/BCCD

The organization of the assembly instructions was good.	What could be done to improve the organization of the assembly instructions?
Somewhat Agree	Perhaps a little more troubleshooting guidance.
Neutral	We hardly used the assembly instructions. The example LittleFe was what we relied on the most.
Strongly Agree	The organization was excellent.
Neutral	Update them to match the hardware used.
Strongly Agree	Some of the instructions on the wiki seemed to be out of order
Strongly Agree	The instructions were adequate
Strongly Agree	Fine by me.
Somewhat Agree	The organization is good. However it would much better if more tools would be available.
Strongly Agree	None
Somewhat Agree	A few steps were vague. For instance, the orientation of certain frame components is critical, but a couple were not mentioned.
Disagree	The assembly instructions we not helpful. However, having a completed unit to model and knowledgeable staff for questions was extremely helpful.
Strongly Agree	
Strongly Agree	I thought they were well organized.

The content of the assembly instructions was clear.	What could be done to improve the content of the assembly instructions?
Somewhat Agree	Details about the unique parts that look alike, but it is critical to distinguish certain parts one from the other.
Neutral	Honestly, the example LittleFe that was floated around the room was a lot more helpful than the written instructions or the video. Someone should make an IKEA-style set of assembly instructions that illustrate the various stages of assembly with exploded views of the various components. Another improvement would be to emphasize the order in which components should be added, i.e. you shouldn't build the enclosure entirely before attaching the power supply... or don't insert screws and assemble the inner panel without the cable holders. Mostly, I think some folks had difficulties finishing the build in good time because they had to disassemble certain pieces and start over.
Strongly Agree	Include more pictures of the assembly steps to improve clarity.
Somewhat Agree	Video instructions of how to build it.
Somewhat Agree	The content was really good
Strongly Agree	Instructions were adequate
Somewhat Agree	It would help to have labelled photos of each of the pieces and each of the steps. Our team spent some time arguing over instruction interpretations that arose from misunderstanding the intent in a few places. Overall, though, they were excellent!
Somewhat Agree	A handout on steps. Labels on parts.
Strongly Agree	None

Somewhat Agree	A few steps were vague. For instance, the orientation of certain frame components is critical, but a couple were not mentioned.
Disagree	A step by step process, with images of the involved parts for each step, and an image of the completed step would be extremely helpful. I know that since hardware changes, the images might not exactly line up with reality, but just getting the basic box together in right order is a bit challenging; especially since it helps to wait to assemble certain components until other components have already been assembled because of low clearance for screwdrivers, etc.
Strongly Agree	
Strongly Agree	The content was great

The Buildout leaders were helpful and/or useful.	What could be done to improve the helpfulness/usefulness of the Buildout leaders?
Strongly Agree	Consistency with the training tips.
Strongly Agree	Nothing. You guys did a great job.
Strongly Agree	They were very helpful.
Strongly Agree	Don't know
Somewhat Agree	I thought that they ere very helpful
Strongly Agree	The were very helpful
Strongly Agree	You guys were simply amazing. Thank you. We had a couple of glitches with our parts due to their use in previous demos, and you were wonderful in helping us through all of our issues as they arose.
Strongly Agree	They are knowledgeable.
Strongly Agree	None
Strongly Agree	They were great

Strongly Agree	nothing. maybe they could have snacks. It would help if they had more tools. wrenches and screwdrivers are cheap and plentiful, a few more would have made the process quicker and easier.
Strongly Agree	
Strongly Agree	They were all extremely helpful!

Were there problems with the quality of your LittleFe assembly kit?	If 'other', please explain:
Other	Knowing the different parts that closely resembled eachother.
Other	Wifi doesn't work, but it's a software issue. LED mount covers up a port on the motherboard, and it seems like it would be easy to damage a node given that the new boards have pieces brushing against the screws when you insert them... it was one in particular, don't remember which.
No problems with the assembly kit	
Other	Screwdriver keep disappearing
Damaged Parts	
No problems with the assembly kit	
Damaged Parts	
Missing Parts	
No problems with the assembly kit	
Damaged Parts	A couple of screws were missing. The WiFi was damaged. Mine was a previously assembled unit which had been disassembled prior to the buildout.
No problems with the assembly kit	

Other	One board is not starting immediately after transportation/defect persists / might a board fabrication quality issue.
No problems with the assembly kit	

III. Experiences Using LittleFe/BCCD

The event examples and demonstrations of High Performance Computing (HPC), Parallel Programming, and Computational/Data Enabled Science and Engineering were interesting and useful.	What could be done to improve the usefulness of the examples and demonstrations?
Strongly Agree	The LittleFe model was most helpful. Perhaps one more model would help with sharing the demo parts.
Neutral	I don't remember what was done with examples and demos. My partner and I spent the time playing with the demos that were on the machine already.
Somewhat Agree	Implement a centralized repository with detailed instructions.
Somewhat Agree	More practice with the software
Strongly Agree	I thought that some of the teaching modules were more useful than others
Strongly Agree	Provide a repository of all examples demonstrations for new users to how others use the LittleFe in the classroom
Somewhat Agree	It would have been helpful to have more concrete examples of how LittleFe is built into a variety of teaching situations, from traditional CS classrooms to segments within more diverse courses. This would include listing learning objectives and expected background for each of the activities, and discussing the successes and challenges seen in the actual teaching use. I would also have been interested in each of the participating teams being expected to

	bring an assignment/activity to explain to the rest of the group, both for idea sharing and content workshopping purposes. It was a little unclear whether buildout participants were expected to be complete novices or experts, which made it difficult to pitch the tone of the demos. Perhaps have us complete a short pre-training online to confirm that we have a baseline knowledge and go from there?
Somewhat Agree	The examples are good. Easy to follow.
Strongly Agree	None
Strongly Agree	It was all good. There was more material than I could absorb at once.
Strongly Agree	they were goodq
Strongly Agree	Visualization is important and attractive for students or virtual reality / we are looking into stereoscopic display and 3D augmented reality
Strongly Agree	I thought they were great. I'll try to improve the module I've created so that they can be more useful out of the box.

The event examples and demonstrations of High Performance Computing (HPC), Parallel Programming, and Computational/Data Enabled Science and Engineering were interesting and useful.	What could be done to improve the quality of the Buildout leader's presentations of examples and demonstrations?
Strongly Agree	Consistency with the training.
Neutral	Not sure. It's difficult to say what level of knowledge these should be geared towards. Certainly it seems like for some it might be a good idea to have a short tutorial on MPI, while for others it might be a waste of time.
Somewhat Agree	They were of high quality.

Somewhat Agree	Videos that could be viewed on iPads on common problems the beginners experience with the littlefes
Strongly Agree	I think that since the range of experience varied so much throughout the presentation some were easier to follow than others/
Strongly Agree	None
Somewhat Agree	NA
Somewhat Agree	The project is kind of difficult to see.
Strongly Agree	None
Strongly Agree	Just keep on getting others to present how they are using it. I will be using the OS examples in my Spring OS course
Strongly Agree	they were good
Strongly Agree	More examples that to be attractive for kids have to developed that to be easy to understand even for heterogeneous backgrounds.
Strongly Agree	They were fine.

The event examples and demonstrations of High Performance Computing (HPC), Parallel Programming, and Computational/Data Enabled Science and Engineering were interesting and useful.	What other kinds of examples or demonstrations could be presented?
Strongly Agree	More software demos.
Neutral	Cuda perhaps? It would be instructive to see an overview of some research work done using a LittleFe. It would probably be most instructive to see a simple performance analysis... it could give folks something to talk about after they leave the room.
Somewhat Agree	1) Speedup and scalability examples (with both OpnMP ans MPI) 2) Simple CUDA examples

Somewhat Agree	?
Strongly Agree	It would be interesting to see how the actual hard ware can be used
Strongly Agree	Some examples on how to use the GPUs
Somewhat Agree	If expectation is that participants don't know how to write/run MPI code, a couple of simple problems would be great. Otherwise, perhaps a discussion of sequencing styles for developing student skills and curriculum organization for different course styles?
Somewhat Agree	It is good enough.
Strongly Agree	None
Strongly Agree	I'd like to see some examples of how this could be introduced in a CS/1 course.
Strongly Agree	?
Strongly Agree	I do not know now.
Strongly Agree	I'm going to produce some more physics/chemistry applications of LittleFe

The event examples and demonstrations of High Performance Computing (HPC), Parallel Programming, and Computational/Data Enabled Science and Engineering were interesting and useful.	In addition to demonstrations and examples, what different ways of showing teaching uses of LittleFe/BCCD could be considered?
Strongly Agree	Outreach examples.
Neutral	If there are any simple demonstrable ways of scheduling student access to a machine to give them exclusive access for a time, it might be useful to those looking to use LittleFe in a classroom.
Somewhat Agree	If we disassemble a reassemble it in class, it can be used as tool to introduce concepts in the courses, (1) Introduction to Computer Architecture and (2) Introduction to Networking.

Somewhat Agree	Other subjects besides computer science
Strongly Agree	Again, I think that using the actual hardware could be a great teaching tool since these aren't "magic boxes"
Strongly Agree	Youtube videos will help
Somewhat Agree	NA
Somewhat Agree	Actually a quick and simple example of MPI or openmp would be good.
Strongly Agree	None
Strongly Agree	Probably uses in student directed research.
Strongly Agree	not sure
Strongly Agree	We are thinking about this, is just under debate with our members.
Strongly Agree	Maybe include some complete curricular materials? Again.. I'll try to contribute some soon.

The event examples and demonstrations of High Performance Computing (HPC), Parallel Programming, and Computational/Data Enabled Science and Engineering were interesting and useful.	In addition to demonstrations and examples, what different ways of showing teaching uses of LittleFe/BCCD could be considered?
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Somewhat Agree	Actually a quick and simple example of MPI or openmp would be good.
Strongly Agree	None
Strongly Agree	Probably uses in student directed research.
Strongly Agree	not sure
Strongly Agree	We are thinking about this, is just under debate with our members.
Strongly Agree	Maybe include some complete curricular materials? Again.. I'll try to contribute some soon.

IV. Suggestions for improvements to LittleFe/BCCD training and outreach strategies

What additional comments do you have on the LittleFe/BCCD Buildout or how to improve it?
Open up training to middle school students.
Wake on LAN or some other hack to turn on the nodes remotely would be nice.
To have available a complete set of tools for each team. Sometimes we had to wait because we didn't have the appropriate tool. This is not a big deal but it can improve the buildout a bit.
?
none
youtube videos may help participants in the buildout of LittleFe/BCCD. Videos showcasing how different programs use the LittleFe in clas may also help new users.
I appreciate that you guys decided to take longer for the buildout this year than last year. I think that the 3 days may have been more than necessary, however. Maybe 2 days next time, with most of day 2 focused around curriculum development? That would also improve

networking between the various teams. Alternatively, it could be over more days but only during afternoons or mornings so that participants have a clear understanding of when they need to be at the buildout and when they can pop out to participate in the HPC Educator workshops.
No comments. Thanks.
None
Make sure that each station has all of the appropriate tools. We occasionally had to share.
more tools. possibly some electric screwdrivers
To early for me to come with something now.
Interested in using LittleFe for outreach in schools in our area.

What additional comments do you have on ways other than workshops to train faculty, instructors and students on the use of LittleFe/BCCD in teaching?
Perhaps site visits where the LittleFe is put to great use.
Emphasize the modules that are already available. They are very well done, from what I've seen.
1) Have available manuals of parts especially of the motherboard, and other main components for possible troubleshoot if any problem arises. 2) Have a email list (forum, etc) for discussion, questions and answers.
Just more hand on trianing time
some sort of mailing group
.Provide the driver for the wireless module. It was not working when we completed the buildout
I am so impressed with what you guys are doing. Thank you so much!!!
It would be nice if there are grants to support high schools to build their own LittleFe under the supervision of the faculty who went through the Buildout training program.
None
The LittleFe website needs to have more links to curriculum material, and needs to be updated with current information on new events.
?

We will try to teach the teacher in training sessions, and then let him/her have the computer for a while to explore at home the software on it and applications in order to teach the students / that will require a hard drive copy for restoration. We might make it online, but we might get access to bigger computers and they might not enjoy as much the beauty of parallel processing. We tested that last week and seems to work, but depends on internet access, and we did not finished.

I can't think of anything right now, but I'm sure we'll be in touch!