Global Online Labs Consortium Meeting Notes from 28 January 2010

Outcomes of discussion from Governance working group:

(M. Auer): Summary of outcomes from meeting on the 27th available in the handout.
We will continue to discuss each section and take comments:

I. Objectives of consortium:
- Try to formulate short, medium and long term objectives
- Formulated main focus of consortium are education and laboratories within University institutions

Comments:

(P. Long): Agrees with the objectives and suggests that there are some short-term, incremental activities that need to be done to build trust, test our ability to work collaboratively together, and have a proximate set of deliverables. Suggests 3 options:

1) Define lab specification for publishing of labs and write codes that each of us could use to publish availability of (or announce the presence of) a working lab and its mechanism for being accessed (in whatever architecture it happens to reside). The idea is that there is a common site for lab information and status.
2) If we are looking at ways of interaction and exploring possible convergence - everyone who has code (in the various architectures) should make it accessible to anyone else in this room. That means the code in documentation needs to be sharable amongst this group for the various people that have code and running systems.
3) Longer term (first 9 months) - standardized cross authentication code.

The first two options should be do-able in the next 45-60 days. At the very least we should be able to define and publish spec for availability of labs in a skeletal form.

(M. Auer): Asks which section these points should correspond with in the handout.

(J. Harward): Suggests an appendix that corresponds to the Tasks.

(M. Auer): Volunteers his group to take on the first task. Asks who would consider taking on the second task above.

(J. Harward): Considers it a matter of self publication – each system has experiments but has a common mechanism by which they self publish on a site that self aggregates and presents visually to a community.

(P. Long): The key is what's in it has to be in buildable code.

(J. Harward): One of the prime candidates for the authentication scheme is John's group. The time frame on whether development can be done in the next 6-12 months is dependent on John's commitment.

(J. Zornig): Will take this offline to discuss with Phil before committing.

(D. Lowe): Suggests that some questions need to be asked before the technical specifications are discussed. In particular:
 1) Are those 3 things (particularly the first 2) the right test for whether or not we are ready to be doing it? Important for all of us to agree.

(P. Bailey): The first 2 are quite easy to do and not really a test to see if we're going to make it as a consortium. Whether or not we can come up with a specification or at least one single way of authorizing across domain is the real test whether or not we can do this. We will need all three.

(J. Harward): In order to incorporate, we are not prepared to wait until the end of the year - what are you proposing?

(P. Baily): Proposes the design be more cooperative than one person's design.

(K. DeLong): None of these will be done alone. There will be a workgroup from each party, so the first two will be a good test for point of collaboration. However, there is going to be a need for a committee for the last option.

(D.Lowe): Thinks the first 2 are good tests and should be relatively simple. The authentication one will probably take 18 months (more complexity). There will probably be an intermediate between publishing labs and availability and cross system authentication.
If you tunnel in from someone else's system to the lab server to get access to the labs, you need to be authorized but not authenticated. There's a simpler intermediate step in terms of defining a mechanism. If we are creating mechanism for publishing lab specs, there is an extension to that which is publishing a mechanism for accessing that lab.

(P. Long): That is the task of that group to identify the layers of the process.

(J. Harward): One of the issues here is that we need a sketch for a go/no go decision… Incorporation needs to go through each of our legal institutions. We do not need to agree on technical goals, but near term goals (such as open repository, lab authentication) need to happen before we take significant steps. We need to show active lab sharing within a 12 month time frame. We need to establish a process to define the 3rd goal quickly.

(P. Long): A common vocabulary also needs to be considered.

(M. Auer): We should work out the first 2 points within 3 months (latest). For the 3rd point - we should have lists of tasks within 6 months and 12 months for shared use.

(T. Richter): Very important when we are collecting information about labs – the conditions of usage are important to decide whether we need a consortium to share it or an interest group. If it's a give and take situation, then we would need partnership within a consortium to do that.

(M. Auer): Other comments regarding Objectives of the Consortium that you would like to raise?

(J. Zornig): Consortium should have an outreach objective to bring in potential users of labs (locate and find potential users).

Clarify first bullet in the section as "Creation and use of infrastructure…"

(E. Lindsay): There is a difference between the consortium building different labs and finding people to use labs.

(J.Harward): How do you plan on finding new people?

(E. Lindsay): As part of the outreach activities, we would state that we use remote labs and why don't you add yourself to our community?

(A. Louka): As members of this consortium, one of our objectives during any public forum or conferences should be to present the consortium as encouraging people to come and make use of the labs.

(J. Harward): In an academic environment you cannot require an academic to market .

(M. Auer): One of the aims of the consortium is also to give information about the consortium and the online labs

(K.DeLong): Perhaps then change 3rd bullet point to create/establish support community and scholars and users? Put under tasks?

(E. Lindsay): I think John's point is that there is no marketing objective listed here.

(J. Harward): A marketing objective might be inappropriate as a guiding principle. Phil suggests this may be a cultural issue, as this would not go down well in an American academic environment and not part of the role of a consortium.

(M. Auer): We use the term online labs, remote labs… from my point of view - it is online labs. Is it ok to use this term to prevent confusion? Our focus isn't only remote labs, but online labs.

(P. Long): This is similar to a discussion we had the other day under Principles of Work. Noticed under the last point under Principles of Work is "Educational value drives technology." The first principle is already part of our mindset. We might consider ways of addressing recognition of community outreach without the mandatory goal of the consortium to go out and convert people.

(M. Auer): We use the terms remote lab and online lab – from my point of view our focus is really online labs. Do we all agree with this definition?

All agree.

II. Principles of Work:

(M. Auer): It was suggested at yesterday's discussions that we should not start with the first statement or perhaps change the order. Any suggestions?

(P. Long): Generally don't like to see negatives in Principles - perhaps can restate the first statement as, "Consortium should honor the individual member autonomy…"

(M. Auer): No comments? All agree?

(T. Richter): Is the principle of the consortium to develop one global infrastructure or to design interfaces between the existing installations?

(D. Lowe): Isn't that the question for the consortium in terms of how it best achieves its objectives? The consortium will need to discuss what will be the best way to encourage the promotion of labs.

(K. DeLong): The first step is to be able to share labs. The consortium will then evolve from that.

(S. Togboa): To ask the questions differently – the architecture we are talking about here, is it one that we enable various labs to be shared?

(K. DeLong): Yes, for the first stage it's the three components that we discussed – the publishing of labs, the sharing of documentation of API's, and the cross authentication issues. Over time that should grow into other components.

(H. Saliah-Hassan): One question, under "Clear difference between technical and political issues", I think there is a need for policy in terms of agreement for sharing labs. Discuss policy

(M. Auer): There is a difference between political and policy. Political can also be technical.

(H. Saliah-Hassan) For policy, you would need a higher level of agreement from an institution. For example, if we want to set up one login for all the partners, you have a lab and the partner has a different lab infrastructure and you want to use a lab component, there needs to be a policy or agreement set up by the technical group to allow use of the lab facilities.

(K. DeLong): Policy for conditions of use?

(J. Harward): I think there is agreement that we should make a policy by which you can use individual labs clear. The consortium wants to encourage the sharing of labs, but because we respect the autonomy of the institutions involved, we would never require institutions to share labs.

III. Structure of the Consortium:

(M. Auer): In principle, it is a very clear structure as shown on the handout.

For clarification, the term "Vice President" should be removed. The 3 people representing each of the standing committees are "Chairs" and are also members of the executive committee.

IV. Membership

(M. Auer): Discuss what's necessary to be a member of this consortium. Is it necessary to declare membership, or pay fees, etc.?

(J. Harward): Shouldn't this be determined by economic and executive committee? Another thing to note is that members will vote at the annual general meeting. Members should be actively involved and contribute to the consortium. We wouldn't want the consortium's agenda driven by users who are using the labs and not contributing. We need to define what constitutes "membership" and contribution will be critical.

(K. DeLong): We determined Industry as affiliates and non voting members.

(E. Lindsay): A question regarding the method of nature of what we are talking about here - we have 6 different sharing autonomous groups that themselves have members. So, is a person a member or part of a University, is that University a member, or is that University part of that shared network of labs and is that shared network is a member? Where does the hierarchy work? Later on with the recruitment stage, this will be important. What would they be joining?

(J. Harward): Comes down to voting rights (decision making process). If there are few members, and there are organizational members, we need a way to weigh votes. That, however, would cause it to be potentially more difficult than making the smaller autonomic decision of what criteria, what level of participation or contribution would be minimal to be a member.

(M. Auer): As a first step for agreement, a member is a person who declares themselves a member and actively works in the consortium.

(S. Togboa): Still need to understand whether the membership intended to arise from possible stakeholders or not? Within the categories of stakeholders you have those who purely use the labs and contribution would be by way of development of curriculum without being involved in the development of the labs. Are they included as members or not? Need to narrow who will be included as members rather than leave it at the stakeholder level in which case you have so many different people defining all kinds of interest and coming onboard. Looking at list of stakeholders – the top one lists members.

(J. Harward): Exofficial – One school of thought yesterday suggested that corporate affiliates (non profit associates) might be exofficial. They would have no votes but can attend meetings and voice views.

(T. Richter): Another term used by ISO is "observing members".

(P. Long): The key to a vibrant organization is that the people in the category of membership will actually do something. There are two questions:
1) Who has the criteria to be a member?
2) What are the criteria to remain a member? We require metrics to assess participation.

(M. Auer): For the mission statement, we don't need to formulate details. The by-laws will state decision making and so forth.

(S. Togboa): My understanding is that when we gathered in Cambridge last June, we were invited on the basis that in some institutions there are some activities that are related to this area of remote engineering and online labs. I came to Cambridge because there are activities happening in my University related to this. My understanding of coming into this consortium is that we develop bridge to share these units and that membership is hinging on these units. In terms of voting, there would be representation of this unit that form this and that is where we should be defining membership. There could be a specialized category for those individuals whose contribution should be appreciated.

(J. Harward): Both Phil and I support that. Tricky part is how we define contribution.

(P. Long): Contribution is how to sustain it and keep it alive.

(J. Harward): Another issue to raise… the consortium will need a budget. One source for raising that budget is from institutions that want to use labs, but not contribute labs - if they pay money into consortium, do we deny them any share of the political process?

V. Dissemination:

(T. Richter): Suggests a central webpage.

(J. Harward): Exchanging members across projects – shared developers.

VI. IP Issues:

(T. Richter): Should say open source license without copyright statement.

VII. Establishing the Consortium:

(M. Auer): Establish a temporary proto Executive Committee - PhilL, JudH, DavidL, MichaelA

All agree

Comments:

(D. Lowe): One of the observations made yesterday indicated that one of the reasons why each of the four working parties that were established previously hadn't really made much progress was partly because they were too large - making it difficult for progress to be made. What we thought we needed to do this time around is to make it more targeted, therefore setting up a temporary Executive Committee until we get incorporated. The three proto standing committee - TECH, EDUC and ECON - at this point should be more sharply focused. The terms of referencing between now and incorporation of the consortium – is what does each of the three committees need to achieve. There's a separate temporary working party which will look at the incorporation issues, bylaws and mission statement – basically a refined version of the document that Michael has put together for today. Once that's done, the temporary working parties won't exist beyond that point. The other three committees will and over the next two weeks, each of those three committees will produce its own draft of actions between now and the end of the next year. This will then be given back to the Executive Committee to review.

(M. Auer): Suggests adding the first 3 points mentioned earlier as first steps to establishing the consortium.

(J. Harward): Hope to refine the 3 points at the technical section this afternoon.

(M. Auer): Names will be put against those relevant committees at each working session.

VIII. Economics Session:

(P. Long): First assumption moving forward was that there is some sort of open source set of services. For the sake of moving discussion forward, for the time being will refer to "a system" rather than 6 systems. Handout document referred to literature for successful strategies for open source entrepreneurial models and categorized in the context of an online consortium.

Listed as business strategy areas:
1) Overall business strategies
2) Cost accrual
3) How different devices, experiments, and infrastructure signal events that might relate to usage for potential cost models.

Business models summary listing is shown on the handout:
- Optimization Strategy: Base line set of services that end up being commodity based services. Key issue is the specialized service built on top. In our case, the remote lab might offer a core set of services of authorization, authentication and data storage, but particulars of a given experiment might be specialized that enable us to focus the business model around.
- Dual Licensing Strategy: Takes forward notion that there is open source, freely accessible and implementable set of services and resources. Could be derivatives for what you charge. Overall feature set, customizations (keep yourself or to the entity that's delivering the customized services) and charge for it. Common for those that use open source. Usually used for awareness and market share.
- Consulting Strategy: RedHat strategy – making everything available for free and what you add is packaging and subsequent additional support and maintenance.
- Subscription Strategy: You sell the service, not the software, code or experiment. Good for scaling.
- Patronage Strategy: Assumes that there is already a 3rd party provider involved. Sell services based on what the particular 3rd party might use – i.e. the remote lab infrastructure to sell particular things onto it. The organization that provides it will get a license fee. Integrated delivery mechanism.
- Embedded Strategy: Looking at elements that we converge on that provides key services and consider independently making them accessible to others with similar needs.
- Advertising/Google Strategy: Splash all over the user interface, whatever the advertiser wants us to promote. Basically selling screen space.

(P. Bailey): Anything about consortium membership fees?

(P. Long): First part of the business model was focused on the ongoing way of sustaining something. The membership and organization itself is a different category. Haven't considered it because didn't know what services or benefits would accrue to a member. It could be membership fees, institutional fees, usage fees to the system that we provide, sell curriculum, etc. We need to first identify what this group is going to produce or make available.

(J. Harward): What if a user (who is not contributing) wants to use labs from both MIT and Labshare? How do we do that? Are they a member of the consortium?

(P. Long): How I see it is that they are a customer of the consortium. As a consequence, there is a negotiated fee schedule for access to the labs.

(P. Long): The idea is to come up with a total cost of ownership, but it first takes putting a lab in place to determine the expenses. Two different things there - putting in place set of expenses and running it/maintenance set of expenses.

From the technical committee's perspective, the extent to which you could build in meaningful event notification about how the equipment is being used or event processes where meaningful costs are taking place, it would be helpful to have a standardized way of doing that in our architecture.

David: Other observations or remarks?

(K. Jona): Would like to further discuss the category of people who are primarily focused on consuming and using the labs, not necessarily building the labs. Lab availability and access will be the key deliverable product that the majority of people will use and not the category of coders or system administrators. There is potentially a large and untapped user community that would account for revenue source that should be factored in.

(J. Harward): Asks the question of whether anyone has an idea (in the United States) what an average university would budget per student a semester for lab costs and what an average high school would budget per student a year for an IT course?

(K. Jona): No, but knows what the numbers look like in high schools, however the fact is that for most schools (especially the urban ones) it's well acknowledged that they are trying to match the budget that's currently being spent providing adequate resources. Thinks that there is a critical mass issue and we are collectively relatively early in the development stage for the number of resources that are actually usable and if you total the number in this room, you can maybe get to about 100 labs. It's an issue he finds with consumer audiences – they want it but in order to make it a viable package size that's economically viable, there has to be more and we can't be blind to where we are in the growth curve.

(D. Lowe): Agrees that it's an issue of where we are in the curve at the moment.

(K. Jona): By aggregating the work that individual groups are doing in the consortium, we can get the numbers up and uncover the revenue streams earlier.

(D. Lowe): One additional thing we need to do before leaving Economic topic is to discuss membership of the core group to progress this until the end of the year. The first question is the size of our group. Would like to see volunteers.

(J. Harward): Like to nominate Phil Long.

(P. Long): Happy to accept. Also would like to nominate Christian and David.

(D. Lowe): Accepted Christian and David. First task for that core group for the next two weeks is to define a certain terms of reference for the next 6 months – what the important things to achieve are in the timeline.

IX. Consortium Name:

(J. Harward): On the proposed names, have we done trademark and web searches? We should do that now since we have internet connectivity.

(J. Harward): Would like to start off by saying that if MIT are behind this meta-consortium, we have no interest in this being called iLabs as we now have a subset of the membership. Thinks its more important

if we think of iLabs as a technology and not an organization. So we should take it off the list of options. Some options suggested might be appropriate in one part of the world and not the other.

(A. Louka): See the common denominator as "l.a.b." Should be looking at and including that?

(P. Bailey): There's another option - remote experiment and active labs-> REALabs

List of Options:

- REALabs (Some urls taken or being used)
- Labexchange (AVAILABLE)
- Ulabs (ubiquitous labs? Universal labs, You Labs?) (TAKEN)

(M. Auer): Would like to confirm if we are searching for consortium or acronym? Do we need an acronym or not? If not, we can use something like Online Lab Consortium. Full name should indicate the goal of the consortium.

- ONLINELab (TAKEN)
- onlinelab.org (Available for$3088)
- global-labs.org (AVAILABLE)
- global-labsonline
- globallabsonline.org (AVAILABLE)
- online-lab.net/online-lab.org
- Global Online Laboratory Consortium (trading as Edu labs)

AGREED: Global Online Laboratory Consortium
(M. Auer): Already have the domain, onlinelab.net and willing to use it.

(K. DeLong): globallabs.com (FOR SALE)

(E. Lindsay): Is this for consumers or providers? If it's for people who are already members, might not be necessary.

(J. Harward): We would want a domain that eventually becomes the expanding website for both consumers and providers.

(P. Long): You want to get the domain now and you can grow with.

(K. Jona): Disagree. Thinks that the majority of the users will come looking for labs and if we have a site for them, it would look very different than if we have a site that's targeted for recruiting consortium members, acknowledging consortium founders, etc. This will be a completely different web design.

(J. Harward): Our experience indicates that domain names get snapped up and we should get something we grow into.

(K. Jona): We should acknowledge that there are other uses of the term "labs".

(K. DeLong): global-c (AVAILABLE)

(D. Lowe): Domain name and acronym can be taken offline

X. Education Session:

(M. Schulz): There were four things that were raised in our discussion.
1) Need for a repository
2) Need for common vocabulary
3) Templates for development of experiments and user interface
4) Need for education requirements can be propagated through consortium

Highlights for what could be included in a Repository:

- Some contact point - how do you get access to it? Conditions of use?
- System requirements – if I run this lab what do I need?
- What proprietary components do I need?
- Use cases – what are the other uses that I can have for this experiment? Different scripts developed for this piece of equipment.
- Variance of the user interface (University vs. High schools)
- Evaluations of teachers of this experiment
- Exam questions –education materials attached to particular experiment
- Student requirements/expectations
- Evaluation material of the experiment (pre & post testing)
- Statistics about the experiment – how the class has been using it, where,when, etc. Real-time feedback.
- Indication of operational performance – how many people can I expect to get on to this experiment? How much time will this take up?
- Access & pointers to the data of usage (keeping the student's identity protected)
- Push technology and not Pull technology

Common vocabulary so we are talking about similar things with hardware/software.

Templates to simplify development of an experiment

For educational requirements that the systems do not yet support, how do you get those requirements pushed through the technical committee and get feedback on when the changes will happen?

(H. Saliah-Hassane): We also discussed learning scenarios, learning standards, how to map learning objectives, learning activities, use cases…

(M. Schulz): I'm not sure that we can develop a general template for all experiments that meets everybody's requirements.

(D. Lowe): Did you discuss what the priorities of next steps would be?

(M. Schultz): Next steps - Jim volunteered to develop framework of the repository. He will develop that template to be filled in and delivered back. Two possible sources of the technology, one was lab2go and the other was LiLa. Will generate a generic format to be mapped into the repository. That would be the next steps - what does that template looks like, what is the technology for getting it out.

(P. Long): What is the relationship between this template and repository and the publication announcement of a new lab?

(M. Schultz): It's actually the same thing. One says the information is now available - the other says here's the information. You could scrap the lab server for the information you need from it - It could say here's a new version or what the current status is for the lab.

(M. Auer): In governance group we discussed standards. We discovered we have two types of standards. One is the technical one and the interface and the other one is the educational standards. It could be a good idea to have the laboratories approved or certified by our consortium.

(T. Richter): If it conforms from ISO standards then it's included always.

(D. Lowe): Is there a role for the consortium in (educational) quality control? Do we ratify or certify them in any way. Is it the responsibility of the consortium?

(J. Harward): Initially no. The question is - what is the goal that that serves? If there is a goal, then that is a good thing. If we're just trying to define rules without having a goal in mind, I would be quite uncomfortable with it.

(P. Long): There's at least 2 other issues here. One is, any given experiment may have multiple curricular surrounds to use it. More importantly, the housekeeping seal of approval or best practice needs to come from someone other than the consortium itself and from an external (credible) organization in education.

(E. Lindsay): The approval stamping process should come from us. We've been looking at this from the Labshare side of things in regard to accreditation. As a new technology, everyone is afraid that the accreditation body will not approve if you use remote labs because that's not the way things are done now. If we have a good quality control process saying that a lab doesn't get into our repository or catalogue unless it gets our stamp of approval, and we can show that that stamp of approval requires proper curriculum development, then it helps address that fear. The question is whether we require it of everyone and you do all this extra work or we don't include you or whether we have a base stamp then a gold stamp or how do we go about that?

(K. DeLong): Depends if you're going by US educational standards or Australian standards or Germany standards?

(E. Lindsay): I think the way to go is to go buy our standards and we show how they map back to theirs.

(K. DeLong): There is a lot of work to map each standard. In the US you have a different standard for each state.

(E. Lindsay): We don't have to map to anyone. The people who w ant to use them, they want to take advantage of the fact that we set the bar here, and we can prove that everyone got it across our bar it should then be easy for them to map back to their particular home jurisdiction.

(J. Harward): You are suggesting one bar?

(E. Lindsay): Suggests two bars – One is this is the minimum information we need to put into our catalogue (what your lab is and how it runs) and then if you want our gold tick, you need to tell us what the learning objectives are and how you know you've met them, how you're going to assess them, etc. The second is that you've told us enough that we know that if the students do what you've laid out, they

will achieve the learning outcomes that they're meant to achieve. I believe this gives us a competitive advantage.

(K. Jona): I would suggest that there is a more important level of certification that would distinguish what makes something an online lab itself. For example, an online lab is not something you just watch. Getting to a definition around what we mean by something qualifying as a lab, before getting into the education material, but just the nature of interaction supported by that device and by the surrounding client interface, I would suggest some minimal requirement around the student's ability both design the experiment wrong and be able to get some kind of data back and analyze that. To be able to meet that requirement as a lab would set us apart from numerous other sorts of technology and visualization. That is core, independent of any curriculum built on top of it. That could be an important criteria of acceptance of quality that not only defines the labs, but what we as a consortium are advocating and trying to promote. I would at least start my focus on defining the interactive criteria that we would agree makes it a lab versus something else.

(S. Togboa): There are a number of things that resemble an "online labs" which are not in fact, online labs – which we need to keep out. The earlier issue of certification meant that unless certain defined level of standard was met, we wouldn't put this into our system to be available for others to access. Coming from my background in the developing world where we see this as a mechanism to address the acute deficiencies that we have in experimentation and so forth and that would certainly cut us out. If we go by this certification, I can see that the activities that we are involved in will not meet these standards.

(H. Saliah-Hassane): From my background, I don't agree with what is considered an "online lab". A lab component can be a simulation. A user interface can be a learning object and it is a lab component. It is part of the online laboratory.

(K. DeLong): It's a tutorial versus a lab.

(M. Auer): This shows that we need definitions and the importance of terminology.

(J. Harward): Would like to revisit two issues. On the issue of accreditation, it's important that accreditation is perceived to be fair and speak to the audience. This puts the consortium in for a lot of work because accreditation needs to be performed not once, but repetitively. That also gets into the issue of autonomy. I think we have to be very careful of the goals we hope to serve in the process by which we serve them.
I'd also like to go back to Mark's original information about the repository. It seems to me that there are categories of information that not only announce a lab, but there are other categories of information that you're adding. Do they go into the same repository and are they optional?

(P.Bailey): There is a hierarchy of objects that would be in the repository. There's the actual lab server and experiments that run on the lab that are separate from the surrounds and then there are clients that are associated with that particular experiment, and then there are learning objects that encapsulates the whole thing.

(K. Jona): Currently at the phase where the developers are the ones thinking of the naming schemes and not thinking about the end users perceive what the thing is. The idea that there is a client is meaningless to most people out there and so we struggle internally about what we call a lab and what does that mean and what Phil was saying, it includes the client but other materials around it. What is the main unit of measure that we are accumulating?

(J. Harward): I think we need to keep the audience separate. The people that stitch the software together will call it one thing and the user might use a different terminology. We may need different terminology for different contexts and audiences. We will need to keep in mind other views into this multi-tier organization. Time to register should remain relatively modest. The time to provide the information from the repository should be proportional to the amount of benefit we're all getting from the repository. So the initial amount of information we put in should be relatively modest and easy to do.

XI. Discussion and Closing

(D. Lowe): Poses the question, "What can the consortium do to promote the development of new online labs?"

Suggestions:

- Templates
- Published examples
- Example exercises, screencasts, etc.
- Hosting developers from interested parties

(K. Jona): Asks if this is considering the supply or demand side for promoting the development of new labs?

(D. Lowe): Happy to interpret either way. One of the things that the Labshare project has done was to have Thorsten Kostulski visit and survey Universities across Australia within the departments and schools of Engineering. There are 45 Universities, 35 of which run Engineering programs, and we've got 31 out of those 35 so far signed up who have agreed to participate in this national survey. The survey is doing several things, one is the stock take of what labs are used, what labs aren't available but people would like to be available, etc. The second element is looking at where and how the decisions are made within institutions about supporting the development of engineering laboratories. In other words, who holds the purse strings, who gets to decide which labs get supported, is the Dean the only person who gets to decide or is it the Heads of School, lab managers, etc? We want to understand that so that we can get some idea of who we need to convince on that. Out of the 31 that have agreed to participate, Thorsten has visited 26 of them. Today he's headed out back to Western Australia to visit another one. Once that report is available, which will summarize all that was discussed; we'll make that available publically as well. The reason why I want to mention this is that apart from finding all sorts of interesting things, it's also become very valuable as a promotional exercise – probably even more so than what we expected. The process of awareness raising has been incredibly valuable.

(A. Louka): I'd also be interested to know what other disciplines (within online remote labs) can benefit from remote labs to try to encourage engagement with other institutions. As a consortium we should try to expand into more areas.

(J. Harward): The Universities in Germany, particularly, are focused on chemical engineering. The interesting about electrical engineering labs is that there are almost no consumables. In general, electrical engineering labs are easier to maintain.

(A. Louka): Absolutely agrees, however, it would be interesting to see what other applications there are for the remote labs.

(D. Lowe): As a consortium, is it a priority for us to discuss earlier than later or is it something that can wait?

(J. Harward): That's more of an institutional issue. We've been trying to engage with the Science department with Physics since the beginning.

(D. Lowe): Is this something that the consortium should deal with?
Q: Is there a role for the consortium in promoting online lab educational innovation?
How do we identify what other disciplines can benefit?
How do we move beyond engineering labs? Science, health, design, nursing, etc...

(A. Louka): It's really about representation around this table. We have got a sufficient mix.

(J. Harward): One issue is that you're looking around a table with people who are heavily involved with development of labs, from funding them to organizing a consortium and implementing them. We don't have University help in teaching faculties. Often the relationship between both the administrative sponsors and the developers and the faculty – the faculty doesn't want to be that heavily involved in the nuts and bolt of getting the labs to work. They want to put their educational material in and so it's parallel to Kemi's problem of how much do we want to involve high school teachers. That may depend on your institution. At MIT, you don't start with faculty members. There really isn't an organization with a separate budget to manufacture labs to order for faculty so it tends to be a cycle. If a faculty member is interested you jointly seek funding to build a lab. It would be difficult to get an equal number of faculties to devote the same amount of time to deal with the issues that we're thinking about.

(A. Louka): It's a good point. It's just an opportunity to engage people and worth thinking about as an area for possible expansion for remote labs as an innovative approach.

(D. Lowe): Are there other things that the consortium should or could do to promote innovation in online labs?

(T. Richter): Example labs or example use cases of successful applications of such labs.

(K. DeLong): Doesn't that come in publishing?

(T. Richter): For example, for Physics class we often have the problem that we probably have a lab to do experiments but you still have to design exercises around them as questions that you can address in these labs are valuable information. Physicists have no clue about online labs whatsoever and come up with exercises that make no sense. On the other hand, we (as a computing department) have no idea what the people from physics want to teach. So in that case, it would be really helpful to have such use cases. Not just on paper form but something that comes with the experiment. Here's the experiment, here's the lab and here's how we use it and the outcome.

(K. DeLong): Do your labs go through multiple revisions over time? Do you add any features to the lab?

(T. Richter): Yes, sure I do.

(J. Harward): Forgive me, but the question seems odd because we do many things at MIT - both to engage in faculties (and engaging faculties is a key step for us) and to disseminate. We're jointly carrying out every activity for dissemination and most of us are already involved in promoting educational innovation so are you looking for specific programs that the consortium would sponsor?

(D. Lowe): Not looking for anything in particular, but was trying to trigger suggestions on what could be considered by the education committee. To give you an example, one of the things that we've talked about is the constraints of engineering laboratories, whether they're remotely accessible or past reasons for structuring labs the way they have - whether if it's a resource constraint. The laboratories we run are typically grossly simplified versions of what the students would encounter in professional practice as engineers. So, when we have a set of coupled tanks for control, it's a grossly simplified caricature of what an industrial process might look like. It lets you focus on aspects that you would want to so in some senses you want that simplified version, but there are other cases where it would be beneficial to expose the student to real industrial equipment , processes, in a real industrial context. Traditionally we weren't able to do that unless you took students out on sight which would be highly constrained. One of the things we discusses is are there ways we can go out and talk to industry, identify operational processes and instrument them, and make that data available. To some extent it becomes an observational laboratory because most industries aren't going to let students play with their current production facilities obviously, but it lets them monitor an industrial process, take measurements of it, analyze that data, etc. The question I'm asking is that is there a role for the consortium in trying to identify and promote the idea of alternative uses of what laboratories could be?

(P.Long): One caution – particularly when we're talking about sensor metrics and such there has been a huge committee that has been doing this for a long time and has their own protocols and standards. We just have to be careful of what our strengths and maybe partnering with them to investigate what the relationships might be with existing groups or practices for instrumentation and delivery of data.

(D. Lowe): The question I'm asking is, when we do look at those related areas to build collaboration, is that something we as a consortium be interested in or is this something that is the role of the individual members who are working in this area to do?

(P. Long): Suggesting that there is probably other consortium, organizations or professional groups that have that interested space and is already part of their focus. We should at least be aware and do some environmental scans of where we're stepping.
The other thing that I was going to suggest is that one place where there is opportunity where we haven't really exploited particularly is if you make the case that remote labs can make a substantial contribution to laboratory experience for students in undergraduate courses, then there are implications in the future design of laboratories and rethinking the way space is laid out. Not because you're trying to diminishing hands-on space, but you now have a different factor that allows another form of hybrid experiments that can lead to different space configuration, and certainly different ways in which laboratories are intended for remote use are put in racks or are smaller and easily serviceable to free up floor space.

(K. Jona): Your point draws out something that I've been thinking a lot about. When we look at cross technological innovations, the result is always the case that new technology replicates the current so I think we're at a very similar stage to your point where the idea of a laboratory which is more or less replicating what has been done in a hands-on setting technical which may be a legitimate place to start. The Consortium as a whole could be trying to advance the thinking of what laboratories look like in the future. We should be pushing the boundaries to consider the range of possibilities that are now available. MIT is a great example with their nuclear reactor experiment which would have been inconceivable to be accessible. The piece that I've been focusing on is providing students with access to the authentic tools of practicing professionals. The device that we're working on now at Northwestern is a professional caliber of spectroscopy unit. That just isn't there for educational purposes, but it is what you would actually be using in a lab if you were a practicing scientist or lab technician. The idea is can we use this to close the

gap from educational expectations and continue to expose students to more authentic tools and practices that they would see in industry.

(P. Long): This goes with another direction - there is with the notion of authentic devices in mind, one of the things that manufacturers of these devices have constant issues with is training on them. You can see a way in which remote labs could bring on authentic devices and can offer up some mechanism for reiteration for a remote lab consortium?

(D. Lowe): I do see this as an important area we should be covering. Do we see this as a role that the consortium should be driving? If so how urgent?

(K. Jona): One of the things that I think that is pressing is that the consortium could have an important role in the idea of supporting the legitimization of the user remote labs in education. I know that within the United States, for example, both the College Board that administers the key exams in the University of California system and some other places that specifically prohibit anything but "hands-on or wet-labs" as satisfying the laboratory requirements. This is a problem for broader adoption of the approach and having a global consortium comprised of eminent higher education Universities from around the world that is actively disseminating in a research or best practices, or even just saying, "look, there's X number of Universities with Y number of students that are doing this – and I think it can go a long way to breaking some of those policies barriers that might exist and that might prevent the growth of this area. I don't know if there are similar issues in other countries.

(D. Lowe): As part of Thorsten's visit to other Universities as part of our national survey, one of the areas that we got some reticence from were from institutions that said, "yes, we think this a good idea, but in terms of getting our courses accredited by our ABET equivalent - Engineers Australia (EA), we're not sure if EA will like us using remote labs." The Steering Committee for the Labshare project includes the accreditation manager for EA and he thinks it's a fantastic idea to get the right message across so we played with the idea of getting EA to certify, or rubber stamp them as saying, "yes, this lab is a lab that we believe would be useful and relevant for engineering graduates to core engineering students to be exposed to and would be an acceptable component of the laboratory experience." They're very keen to work with us to find ways of doing that.

(K. Jona): I think the consortium is very well suited for putting policy statements or recommendations or white papers or other things out there that can shape the conversation accordingly in ways that any of us would have a harder time doing because you have that critical mass and the weight of authority. The other way the consortium can help is in conversations with your ABET equivalent is to be talking to them about things like, "well, we can provide more lab access for students, or more iterations, improve learning and putting out the positive messages around the educational benefit so we can move the conversation to areas where strengths and benefits are clear and do line up with many principles that those organizations support.

(J. Harward): I think encouraging publication of evaluations including both evaluations of online lab incrementations, but where possible contrasting studies of a standard hands-on lab and online lab.

(P. Long): One of the things that the consortium might do is to commission or sponsor an independent academic who will do a case study in this area. Can get some of the date we're missing.

(T. Richter): We might be able to organize conference tracks in the academic community to provide data.

(D. Lowe): Before we move on, were there any other comments or suggestions that the education committee should continue to consider?

(J. Zornig): Is it one of the aims of consortium to promote making available labs for disadvantaged countries or students?

(J. Harward): MIT over the past five years has come down very strongly on the idea of Global engineering education. The idea to get MIT students involved in engineering projects in different parts of the work is a substantial part of undergraduate curriculum. iLabs has benefited from that the overall interest at MIT and MIT is also benefitting. The second thing is that in our search for a common platform, particularly with our African partners, we ended up finding the technology that was much simpler and more efficient to use in the revision of the standard in the MIT courses. Makerere has taken the lead in widening our application of the office sequel processing and control courses. In many ways, they are a less conservative education environment so MIT curriculums ended up benefitting. Working outside your own institution can shake up your own technological approach in a constructive way.

(D. Lowe): That's spot on and a very compelling argument for individual groups to look and address at that issue. Is it a compelling case for the consortium to encourage that?

(J. Harward): In terms of case studies that one can encourage a trial program, it might well be useful.

(P. Long): Or partnering in the sense of providing resource and guidance to Engineers Without Borders. We might consider a project, one year, with a place of neutral interest that uses remote labs as a mechanism for delivering education. You can see that we wouldn't as a consortium necessarily take on the ownership of that space, but could fruitfully partner with people for whom that is some place of directed interest and provide a new opportunity that's beneficial to them as well as for us.

(A. Louka). Another area that we haven't spoken about is around Open Universities. Open University Australia/UK who are set up along the online space and whether there are opportunities there in introductory courses?

(D. Lowe): Any other observations? One thing we need to do to finish up with the education area is the committee.

Education Committee:
Mark S.
Kirky D.
Sandy T.
Steve M.

(D. Lowe): Ok, technical, who's driving that, Jud and Steve?

(J. Harward): We thought this might be a good opportunity to refine and better define 3 steps. The one in the middle, opening source code, is simple and straight forward. I think the issue of publishing the lab descriptions to a repository; we hope that's not difficult. There are a number of steps:
1) Refining the amount information that we want to record
2) Design the process by which we capture it
3) Repository

Do we want to use an existing repository? It would be useful to have a small working group that defines exactly what information we wanted. Would 'labs2go' then put up a form to capture that information? How does 'labs2go' want to receive it?

(P. Long): The question about how the publishing process of having the labs come up and pushes the information out of the channel that 'labs2go' listens to, but anybody else that has interest in that area can also listen to it would be a useful thing.

(T. Richter): We are working on a meta-data generator from the LiLa platform , and I think it should be possible to extend that to our needs as soon as we know what our needs are. That is part of our upload process, or scheduled to be that, but of course that could be taken out and used for our needs here.

(P. Long): This may be the first example of a contributing code.

(D. Lowe): Point of clarification – we talked earlier about labs publishing appropriate meta-data and availability and updates, etc. Assuming that all the labs are publishing that information and there is a suitable repository that either receives that published information and then scrapes for whatever else is necessary beyond that – so whether the mechanism publishes a notification that exists and then the repository goes and scrapes it, once you have that mechanism, you can have any number of repositories that track that. You can have labs2go and LiLa and whatever else subscribed to that information and build up to be very similar in content, but represented in quite different ways. Having said that, I think that we should identify or have at least one that we know will have a system that will use it.

(T. Richter): Hopefully labs2go's meta-data and LiLa's meta-data will converge in the near future and whoever else.

(M. Auer): Labs2go is ready to use and we will send you next week or so all the necessary data so that you can import you r data. It's flexible and we can add other tags so it's no problem. Furthermore, we already have work on the way for Jim and Danilo to import automatically from the iLabs service broker.

(J. Harward): Could I suggest a working group for this task consisting of Thomas, Danilo and Jim? And should Mark be part of it too as a representative of education committee?

(D. Lowe): Could I also suggest someone from our team because we at Labshare have been looking at a catalogue and have done a lot of work on the meta-data model (the vacuum one) and would like to find a way to put that into alignment. I have to check first, but possibly Michel de la Villefromoy.

Publishing lab info: Mechanism for publishing lab specs + availability (meta-data + access mechanism)
- Define information / meta-data on labs that should be captured and the mechanisms?
- Small task group to define what information on labs should be captured? Thomas, Danilo, Jim, Mark, Michel?

(J. Harward): I think we're thinking of this task about a year out. I think that we perceive it as the first significant technical challenge. I think we'd like it up and working if we're going to have another meeting potentially at the end of June and quite possibly another meeting in January. We would like the cross-authentication up and running before two meetings out so that the people who attend will have tested the interoperability before the meeting a year intends.
Euan suggested that we might do a pass from each project's authenticator directly to the underlying lab servers. In software architecture terms that seems peculiar to me because we expect the API's between internal components in a system to be more complicated and idiosyncratic and that the consistent external

interface, you'd expect to be at the authentication level presented to the outside world. Now that doesn't mean that it's going to be easier to engineer, but I'd like opinions from the technical people here.

(P. Bailey): I'd prefer to have a gabler through the service brokers so I don't have to change all my underlying codes.

(J. Zornig): I think the lowest hanging fruit in this area would be for everyone to support external simple sign on authenticator such as shibboleth. That would make a nice demonstration of interoperability.

(J. Harward): Who's working on authentication for Sahara?

(D. Lowe): Michel de la Villefromoy is over-looking the technical development for it withTania Machet and Michael Diponio. I suspect that getting cross platform authorization is a simpler issue that getting cross platform authentication, but I don't know enough about the detail of architecture to know that that's the case.

- Standardized cross-authentication (or cross-authorization as a better first step?) AuthN vs AuthZ?

(J. Harward): You have three technical people who voted the other way. I think you'd welcome getting a Sahara authentication person involved in this discussion as soon as possible.

(J. Zornig): I can't imagine that shibboleth wouldn't be in the horizon as that's where the Australian Access Federation is going.

(D. Lowe): Absolutely, and we are looking at shibboleth. I'm not saying that it's not a right or useful target to hit, I'm just not convinced, but I am being rapidly being convinced that that's the easiest initial target. I think that there are a lot of lower hanging fruit than that.

(J. Harward): One way to deal with this is to process it. If we had a cross-authentication working group of John, PhilB, Thomas, and Labshare representative (Tania?) to put together:
- A proposal in 3 months
- A spec in 6
- Prototype by New Year's 2011

Suggests that the Technical Committee (Steve and Jud) to coordinate the task forces.

ACTION: Thomas Richter to set up a mailing list

ACTION: Kirky DeLong to put the names of those in working groups on the Wiki.

(J. Harward): Given our overall goals of merging our architectures, once again, I'm more comfortable with an inclusive group for reaching a decision.

(J. Harward): I'd like to open the floor to other technical issues should have a high priority, if any?

(M. Auer): Who will design the initial webpage?

(D. Lowe): Do we want something initially or are we going to wait until we have confirmation that we will incorporate?

(J. Harward): There is an advantage of having a Wiki be part of the website. Wiki can describe the current state of the organization even if it isn't incorporated. It's also a good way for the membership to track milestone. I would think the 3 month technical document/proposal from the technical committee should be put onto the Wiki.

(D. Lowe): I would suggest that we don't need to resolve when/how that happens now, but the technical committee needs to resolve that within the very near future. Not to have it set up, but to identify the mechanism by which it will be set up and the deadlines for getting it set up in the next 4 weeks.

ACTION: Tech Committee to identify process and timeline for website and Wiki.

(D. Lowe): Are there other action items to give to the technical committee?

(K. Jona): We talked before about the real-time status reporting.

(J. Harward): Are we making this a feature that we'd like to see in the next 12 months across the consortium? Or do you want to see it in iLabs?

(D. Lowe): If there are things that are generally universally desirable and they are not in any of the platforms currently, then it's a good time to say, let's define a mechanism by which it occurs universally so instead of absolutely building it into iLabs, but as a precursor, specify how it can be done in any platform. In this particular case we're saying we're defining the mechanism for publishing the lab specs, I would think something like the dynamic lab availability and the extension to that would make sense to do it as an extension to that rather than doing it in a lab specific way that may or may not end up being more generalize-able.

(J. Harward): I am certainly willing to consider that. I think there are a number of parts about it - how dynamic the labs go and leave out where the repositories are as presumably that requires the scrapping function. Of course the most important status information is not there and if you're not there you can say you're not there. The other thing is I think we're probably talking about technology that has to be graphed this way onto 5 or 6 separate platforms. There won't be a single mechanism to respond to a status request from the repositories. We would be glad, on iLabs' side, to put that into a 12 month time frame. However, the aggregation of the data is presumably going to be the responsibility of labs2go.

(P. Long): If the experiments themselves are publishing their status, then it's a matter of listening and aggregating.

(P. Bailey): It is very unlikely that we will have all of our labs that are in existence publishing.

(K. DeLong): It would be nice to come up with a standard of what people would like, but we're not going to get 6 labs re-implemented with new features in the next 6 months.

(J. Harward): I think the design needs to be done by technical people and I think requirements needs to be from educational people.

- What does status latency mean? Requirements?
- How can this be determined? Design
- Scheduled maintenance?
- Open repositories to code + documentation is made accessible

(K. DeLong): As committees have things that they need, they should think about writing them up in some sort of format so that we can start the process at the next 6th month meeting. Issues arising, or going from one group to another and how the groups are going to interact at the next meeting.

ACTION: Jud Harward and Steve Murray to identify a volunteer to set up a Consortium Wiki – GOLC.

XII. Next Consortium Meeting (June/July):

Makes sense to host in Europe (Villach, Austria) since REV conference is in Stockholm (13 June- 2 July 2010). Ideally it would be good to host meeting a week before REV. Another possibility is to combine with the REV conference in Stockholm.

(P. Long): Suggests setting up a Google Poll Notes to determine location and dates for next meeting.

ACTION: David Lowe to set up Google Poll Notes.

ACTION: All to respond with their availabilities and dates (within 2 weeks).

ACTION: David Lowe to post the notes from the last two days on Wiki.