US ATLAS Physics Analysis Support Task Force Report

2nd North American ATLAS Physics Workshop

O.K. Baker
for the US ATLAS Physics Analysis Support Task Force

Task Force membership

- Keith Baker (Hampton, Chair)
- Gil Gilchriese (LBNL)
- Al Goshaw (Duke)
- David Lissauer (BNL)
- Peter Loch (Arizona)
- Harold Ogren (Indiana)
- Jimmy Proudfoot (ANL)
- Jianming Qian (Michigan)
- Abe Seiden (UC Santa Cruz)

- Ex-Officio:
- Mike Tuts (Research Program Manager)
- Howard Gordon (Deputy Research Program Manager)
- Jim Shank (Executive Program Manager for Physics Support and Computing)
- Mel Shochet (Institutional Board Chair)
- Ian Hinchliffe (Physics Adviser)
- John Huth (Associate Program Manager for Physics and Computing)

Charge to the Physics Analysis Support Task Force

We would like the task force to address the following questions:

1. What should be the role of a national support center and what functions should it provide? What is the definition of the center (type of personnel, facilities, support)?

2. How many regional centers should there be, how should they be supported and what role would they play in the physics analysis support? We are not asking you to select centers, but to guide us in understanding what would serve US ATLAS needs best.

3. What are the requirements for collaborative tools? Effective communication within the US and with CERN will be critical, and understanding what functionality is needed will be important in establishing standards and guidelines that we can all adopt within the US.

- Mike Tuts, Howard Gordon, Jim Shank, Mel Shochet

The process . . .

- The Task Force held it first meeting on Tuesday, May 24
- Discussions from that meeting led to an email to the US ATLAS Collaboration by Keith Baker on behalf of the Task Force requesting input on the Task Force charge and their views of the US ATLAS physics analysis support needs.

Email solicitation to US ATLAS institutions

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Input based upon your experience and your informed opinion is needed. When you develop your response, we hope that you will think about the realities we all face. These include the following.

1. Funding in the base program is low and decreasing. This puts additional pressure on the funding agencies to support our research. Travel funds, especially for foreign trips, are tight.

2. Assembling the critical mass of people needed to carry out the research (discussion meetings, etc) is difficult since we are spread out over nine time zones.

3. Perhaps it would be useful to recall the current activities in analysis support in the US. An existing US-ATLAS Analysis Support Group (ASG) has been set up and is functioning: http://www.usatlas.bnl.gov/atlas_psc/software/support/. BNL has been functioning as a de facto center. Also there have been several physics and detector performance groups meeting in the US. http://agenda.cern.ch/displayLevel.php?fid=296 .

The issue you are specifically asked to address is, what physics analysis support model is needed to make our efforts in ATLAS most effective. A national Physics Analysis Support Center? Regional Centers? An even more distributed effort? What physics analysis support would you require in each case? We also want to know from you what might hinder our participation; what might cause damage to our efforts in this regard.

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Keith Baker for the Physics Analysis Support Task Force

The process . . .

- Comments via
  - email
  - telephone calls
  - face-to-face
- Input from at least 26/34 institutions
  - faculty, staff, postdocs, students
- Weekly meetings initially. Twice weekly (and more) meetings towards the end of the process.

Considerations . . .

- Input from US ATLAS collaboration
- Summaries of comments and conclusions from
  - Federal funding agencies
  - Review committees
- Information about plans from other ATLAS nations
- Information about ATLAS analysis organization plans (ATLAS UTF for e.g. from ATLAS Rome Meeting presentation by Fabiola Gianotti)
- Information about US CMS plans (The LPC, i.e. the 11th Floor of Wilson Hall at FNAL)
- All information was kept on a secure web site for TF members

Objectives

- The ATLAS experiment is at CERN
  - There will be a significant US presence at CERN
  - Close contact between US ATLAS physicists and CERN must be maintained
- Research must be facilitated by the physics analysis support structure, not managed by it.
  - The distinction between physics analysis and physics analysis support is preserved
- The physics analysis support structure must . . .
  - ensure good representation
  - promote visibility of US efforts and of young physicists in ATLAS
  - be flexible to the changing demands of the ATLAS organization and the experimental program
  - be lean and efficient (no additional, unneeded bureaucracy)

Recommendation 1

The physics analysis support organization should consist of an *Analysis Support Group* (ASG) and *Analysis Support Centers* (ASCs). The ASG will consist of a group of experts from throughout US ATLAS universities and laboratories. The ASG will work to provide the required software and analysis support to the collaboration via regional interactions at the ASCs and by direct contacts via the web or email. The Group will be led by a Chairperson, chosen by US ATLAS Management, and a Deputy Chairperson nominated by the Chairperson. It is estimated that about 10 FTEs will be required to form this Group. The geographical distribution of these FTEs is to be defined later by the US ATLAS Management.

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Recommendation 2

There should be three regional Analysis Support Centers: centered in the Eastern US (at BNL), the Midwest (at ANL) and in the Western US (at LBNL). This geographical distribution will facilitate access to the ASCs by universities in all parts of the US. The functions of the ASCs will be to:

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Recommendation 3

BNL should function as the coordination Center for US ATLAS physics analysis support. It will have management and support responsibility for the activities of the Analysis Support Group and the regional Analysis Support Centers. The Chair of the Analysis Support Group will have a close association with BNL, since frequent interaction between the ASG Chair and the US ATLAS Research Program Management is foreseen. BNL will also coordinate and support the deployment of collaborative tools for the ASCs and for general use in US ATLAS.

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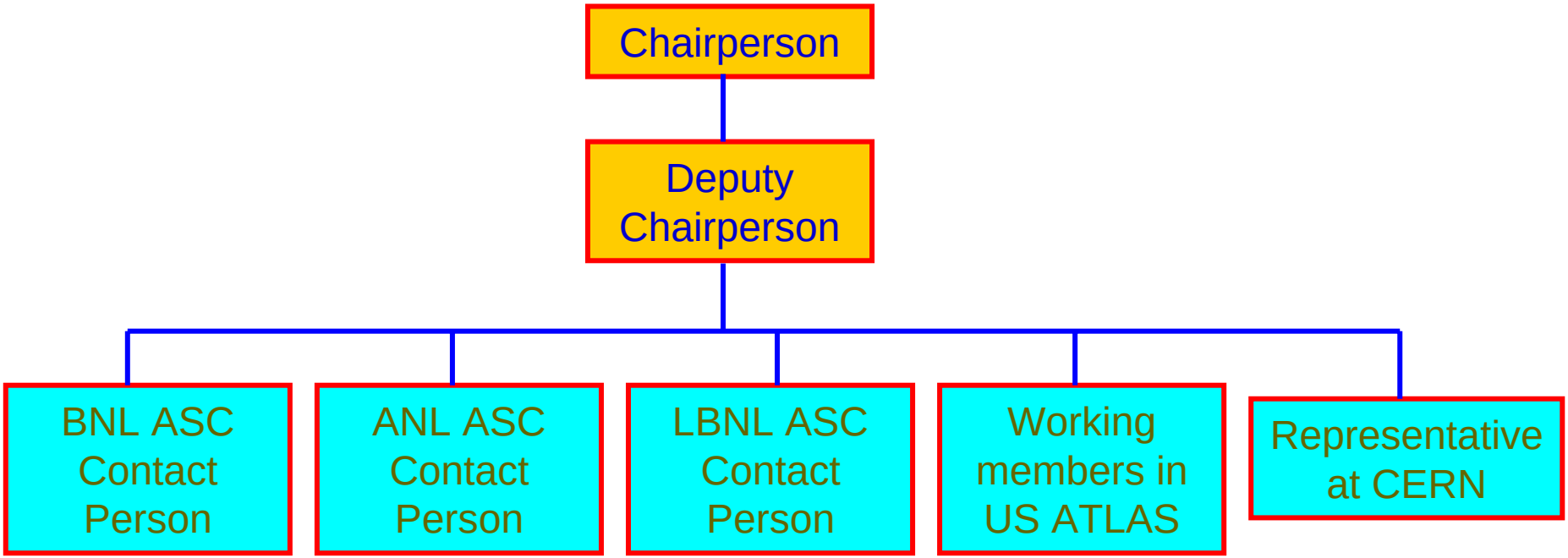
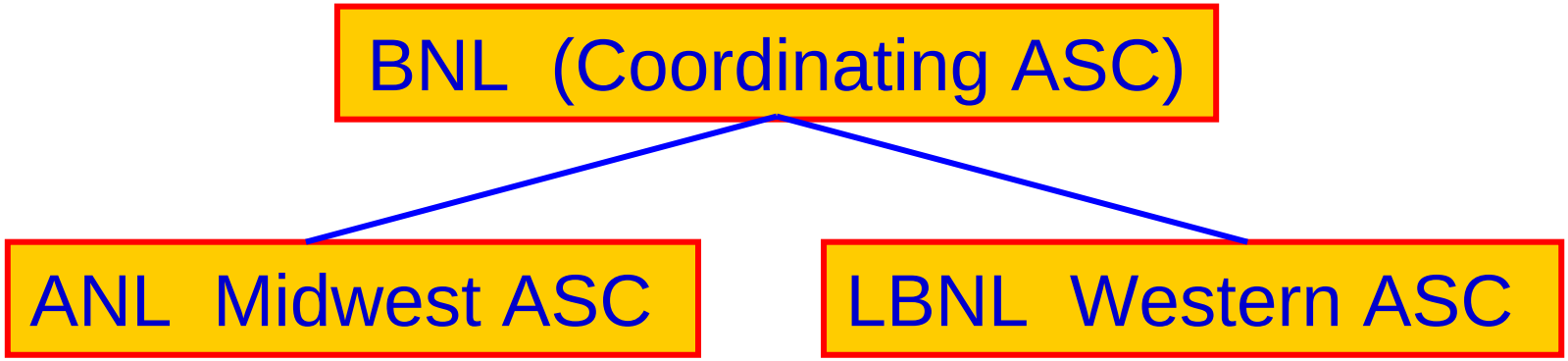
Analysis Support Group

- Provide up-to-date information on sub-detector and software components for US ATLAS physicists.
- Maintain up-to-date analysis web pages, especially US ATLAS Tier 1 and Tier 2 specific aspects.
- Provide materials for analysis software tutorials.
- Identify existing (or the lack of) expertise within US ATLAS; establish a network of support.
- Work with US physicists to resolve software, detector or physics problems encountered in their analyses.
- Facilitate communications by holding regular meetings and providing a forum for technical discussions.

Analysis Support Group



Analysis Support Centers



Analysis Support Centers

- Provide office and meeting space and associated support for researchers during collaborative analysis efforts and for training purposes.
- Provide technical assistance to students, postdoctoral researchers, university faculty members, and groups in setting up their local analysis environment.
- In collaboration with universities in the region, organize seminars and training sessions for large groups of researchers.
- Serve as the home base for some members of the Analysis Support Group, contributing expertise to the overall US physics research effort by contributing reconstruction utilities and experts who are rotating members of the Analysis Support Group.
- Establish strong collaboration with the national Tier 1 and the regional Tier 2 computing centers. Examples of this might include providing assistance with and easy access to computing resources and contributing to the data validation efforts at these computing centers.
- Interact with the various ATLAS physics and performance groups.

Collaborative tools

- Research groups need high quality videoconferencing systems in the US and at CERN with appropriate industrial standards to ensure US ATLAS physicists can participate in every major ATLAS physics working group, many of which will meet weekly.
- The ASG Chairperson should assign responsibilities to help coordinate collaborative tool equipment selection and procurement and operation, to share the collective knowledge that has been acquired, and to help reduce communication costs by optimally using IP technology.
- To train new students and researchers, the ASG should offer periodic and up-to-date tutorials that are archived and made available in the collaboration.
- Major US ATLAS meetings (or for this matter ATLAS meetings) should be broadcast to allow a large number of US ATLAS members to follow plenary sessions.
- Improve US ATLAS web pages so that information can be easily found and is kept up to date.

Suggested metrics

- US participation in ATLAS Physics and performance working groups.
- Leadership roles played by US physicists in ATLAS Physics and performance groups.
- US contribution in reconstruction and subsystem software.
- US participation in ATLAS Physics weeks.
- Center utilization – e.g. number of tutorials, number of visitors.

Examples

- De facto ASC at BNL
- Midwest Physics Group
- Collaborative Tools development at a US ATLAS university
- US ATLAS individual and group analyses

Example question/answer 1

- Q: Why three ASCs and why their locations?

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- The functionality proposed is needed by present and likely new US ATLAS institutions. Likely needs range from minimal interactions with this support structure to more extensive usage. Probably not every group or individual will use all of the functionality provided at any particular time.

Example question/answer 2

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- A: No individual or group is forced to use this support structure. It is available for those who want to use it and will be transparent to those who choose to not use it.

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- A: There will be many physicists in the US contributing to ATLAS physics analysis. There is the clear indication that the agencies want to provide support for a COORDINATED effort. We saw no indication that there would be support for a model that was viewed a ‘diffuse’.

Example question/answer 4

- Q: What motivates the number 10 FTEs in the ASG?

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- A: It is meant to be a rough estimate to guide the decision making based upon the expected number of people needed for detector/reconstruction expertise in the ASG and the present number of people at the de facto ASC that already exists. The exact number and placement of ASG membership will be determined by the US ATLAS management.

Summary

- The TF was in unanimous agreement on the recommendations and the report.
- Report was detailed enough to provide crispness, yet general enough to allow flexibility.
- Model/implementation should be reviewed (annually) and possibly revised a couple of years after implementation.