

# Table of Contents

<b>Steve's Notes.....</b>	<b>1</b>
<b>Installing and Running VP1 (Release 14.5.1).....</b>	<b>2</b>
Introduction.....	2
VP1 Use Cases.....	2
Athena Environment.....	2
Install the latest version of VP1.....	2
Install VP1 from pre-built patch.....	3
Test the VP1 Installation.....	3
Run VP1 on Local Muon Cosmic ESD Files.....	4
Use DQ2 to find some ESD files from a run and then Run VP1 on them.....	4
Run VP1 from an Existing Athena Job (Run on Bytestream).....	5
Viewing MDT Data (A Few Examples).....	5
Navigating (A Few Examples).....	6
Getting Muon Spectrometer Detector ID Information.....	6
References.....	6

# Steve's Notes

# Installing and Running VP1 (Release 14.5.1)

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Athena | VP1 | DQ2 | Wire Sag | UM Cluster

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## Introduction

This is a simple tutorial for installing and running VP1 for the visualisation of the ATLAS Geometry and Event Data. It works for CERN (lxplus) and UMT3 (University of Michigan Tier 3 Cluster). It is complementary to the existing documentation found on the VP1 Home Page[\[1\]](#). Please send comments and corrections to Steven.Goldfarb@cern.NOSPAMPLEASE.ch.

## VP1 Use Cases

VP1 runs as an Athena Algorithm and one can install the latest version of VP1 on top of any version of Athena. See the instructions at VP1 Installation[\[2\]](#) for recipes. There are essentially two modes of usage:

1. Install VP1 and run it on an existing data file (with or without running reconstruction). The format can be Bytestream, RDO, ESD, and AOD (anything with data in StoreGate).
2. Run VP1, as part of your existing Athena job, by turning on the appropriate jobOption flags. VP1 needs to be the last top algorithm. The only disadvantage to this is if the job normally takes a long time, due to data or database access or simply processing.

## Athena Environment

To set up Athena, see the instructions at StevenGoldfarbAthena, based on the WorkBook. I assume here that the user has followed the steps:

1. Set Up the CMT Environment
2. Set Up the Athena Environment
3. Check Out the UserAnalysis Package
4. Test the UserAnalysis Package

## Install the latest version of VP1

This is the safest method, as it builds the packages locally. There are also pre-installed patches (instructions at VP1 Installation[\[2\]](#)).

1. Set up Athena environment: (*once per login*)

```
cd ~/TestArea/14.5.1
source cmthome/setup.sh
```

2. Download the vp1patch\_2009-01-30\_checkoutandbuilddall.x[\[3\]](#) script to the work area and make it executable:

```
wget http://cern.ch/atlas-vp1/vp1patches/vp1patch_2009-01-30/vp1patch_2009-01-30_checkoutandbuilddall.x
chmod +x vp1patch_2009-01-30_checkoutandbuilddall.x
```

3. On UMT3, get kerberos permission (using CERN afs password):

```
UMT3> /usr/kerberos/bin/kinit myusername@CERN.CH
```

4. Run the installation script: (*get a coffee*)

```
./vp1patch_2009-01-30_checkoutandbuildall.x
```

## Install VP1 from pre-built patch

Here is a list of pre-built patches already installed at UMT3 (thanks to Bob Ball). For CERN, instructions can be found at [VP1 Installation](#).

## 1. List available patches:

```
UMT3> ls /afs/atlas.umich.edu/Visualize/VP1
/afs/atlas.umich.edu/Visualize/VP1/vp1patch_2008-10-30-LastBackwardsCompat_14.2.22_i
/afs/atlas.umich.edu/Visualize/VP1/vp1patch_2008-10-30-LastBackwardsCompat_14.2.23_i
/afs/atlas.umich.edu/Visualize/VP1/vp1patch_2009-01-30_14.2.24_i686-slc4-gcc34-opt.t
/afs/atlas.umich.edu/Visualize/VP1/vp1patch_2009-01-30_14.2.25_i686-slc4-gcc34-opt.t
/afs/atlas.umich.edu/Visualize/VP1/vp1patch_2009-01-30_14.4.0_i686-slc4-gcc34-opt.ta
/afs/atlas.umich.edu/Visualize/VP1/vp1patch_2009-01-30_14.5.0_i686-slc4-gcc34-opt.ta
/afs/atlas.umich.edu/Visualize/VP1/vp1patch_2009-01-30_14.5.1_i686-slc4-gcc34-opt.ta
/afs/atlas.umich.edu/Visualize/VP1/vp1patch_2009-01-30_checkoutandbuildall.x
```

## 2. Download the installation script:

```
cd ~/TestArea/p14.5.0.1
wget http://cern.ch/atlas-vp1/vp1patches/vp1-install-patch
chmod +x vp1-install-patch
```

## 3. Run the script on the desired patch:

```
./vp1-install-patch /afs/atlas.umich.edu/Visualize/VP1/vp1patch_2009-01-30_14.5.0_i6
```

## Test the VP1 Installation

## 1. Run vp1 to see if all installed correctly

```
vp1
```

## 2. Get some help on the command line options

```
vp1 -h
```

## 3. Try running on the AOD file already created in UserAnalysis

```
cd ~/TestArea/14.5.1/PhysicsAnalysis/AnalysisCommon/UserAnalysis/run
vp1 AOD.pool.root
```

## 4. The VP1 browser will appear after the first event is initialized. Try the following:

1. When the vp1 browser appears, click on "All studies".
2. Add the "Tracks" and "Hits" menus by checking the boxes in the "General" menu.
3. Go to the "Tracks" menu and pick your favorite algorithm under "Detailed Tracks" (forget about Track Particles for now).
4. Add Segments, as you like.
5. Go to the "Hits" menu and pick your favorite hits (MDT\_DriftCircles, for example).
6. Have fun.
7. Click on the blue "right arrow" in the lower left, under the menus, to advance to the next event.

8. Find more complete instructions on the VP1 3D Viewer Pages [↗](#).

## Run VP1 on Local Muon Cosmic ESD Files

This example uses ESD files created from a stripped Muon Cosmic Bytestream data file. You can download the pre-made files here or follow the instructions in StevenGoldfarbAthena to create them yourself.

1. Set up Athena environment: (*once per login*)

```
cd ~/TestArea/14.5.1
source cmthome/setup.sh
```

2. We will do this from the UserAnalysis area:

```
cd ~/TestArea/14.5.1/PhysicsAnalysis/AnalysisCommon/UserAnalysis/run
```

3. Download the ESD's:

- ◆ mdaq.ATLAS.0091060.physics.CosmicMuons.ESD.align.pool.root
- ◆ mdaq.ATLAS.0091060.physics.CosmicMuons.ESD.noalign.pool.root

4. View the ESD file produced w/alignment corrections:

```
vp1 mdaq.ATLAS.0091060.physics.CosmicMuons.ESD.align.pool.root
```

5. View the ESD file produced w/o alignment corrections:

```
vp1 mdaq.ATLAS.0091060.physics.CosmicMuons.ESD.noalign.pool.root
```

## Use DQ2 to find some ESD files from a run and then Run VP1 on them

This example retrieves some data from run 91060 and then runs on it

1. Set up Athena environment: (*once per login*)

```
cd ~/TestArea/14.5.1
source cmthome/setup.sh
```

2. We will do this from the UserAnalysis area:

```
cd ~/TestArea/14.5.1/PhysicsAnalysis/AnalysisCommon/UserAnalysis/run
```

3. Set up DQ2 and get proxy:

```
source /afs/cern.ch/atlas/offline/external/GRID/ddm/DQ2Clients/setup.sh
voms-proxy-init -voms atlas
```

4. Look for all the ESD data sets with TGC trigger:

```
dq2-ls \*91060\*TGC\*ESD\*
```

5. Pick a data set and check if it has files available:

```
dq2-ls -f data08_cos.00091060.physics_TGCwBeam.recon.ESD.o4_r663_tid065979
```

6. Download to the tmp directory:

```
cd /tmp/goldfarb
dq2-get data08_cos.00091060.physics_TGCwBeam.recon.ESD.o4_r663_tid065979
```

7. Run vp1 on one of the files:

```
cd ~/TestArea/14.5.1/PhysicsAnalysis/AnalysisCommon/UserAnalysis/run
vp1 /tmp/goldfarb/data08_cos.00091060.physics_TGCwBeam.recon.ESD.o4_r663_tid065979/E
```

8. Keep the data file on castor for future use:

```
rfcfcp /tmp/goldfarb/data08_cos.00091060.physics_TGCwBeam.recon.ESD.o4_r663_tid065979/E
```

## Run VP1 from an Existing Athena Job (Run on Bytestream)

These instructions show how to integrate VP1 into an existing Athena job by adding the Algorithm. The VP1 Viewer will start up once the initialization of Athena is completed and it has stopped at the first event.

1. Set up Athena environment: (*once per login*)

```
cd ~/TestArea/14.5.1
source cmthome/setup.sh
```

2. Set up the UserAnalysis environment: (*once per login*)

```
cd ~/TestArea/14.5.0.6/PhysicsAnalysis/AnalysisCommon/UserAnalysis/run
source ../cmt/setup.sh
```

3. Add the following lines at the bottom of you favorite top level jobOptions file:

```
from VP1Algs.VP1AlgsConf import VP1Alg
topSequence += VP1Alg()
```

4. **Examples:** Download Stripped Cosmic Bytestream file and jobOptions that include VP1:

- ◆ mdaq.ATLAS.0091060.physics.CosmicMuons.LB0001.SFO-1.\_0001.data (save with same name)
- ◆ vp1\_align.py.txt (save as vp1\_align.py)
- ◆ vp1\_noalign.py.txt (save as vp1\_noalign.py)

5. Run vp1 on the data file, applying alignment corrections:

```
athena -s vp1_align.py | tee vp1_align.log
```

6. Run vp1 on the data file, w/o applying alignment corrections:

```
athena -s vp1_noalign.py | tee vp1_noalign.log
```

## Viewing MDT Data (A Few Examples)

More information:

- VP1 3D Viewer Pages: [ [html](#) ]
- Group Meeting Presentation (15 Sep 2009): [ [pdf](#) ] [ [ppt](#) ]

1. Once vp1 is up, you will get a **Welcome to Virtual Point 1** window.
2. Click on **All Studies**

3. A **General** tab is selected and the **General** menu is showing in the left window. Check the boxes **Tracks** and **Hits**
4. Now a **Tracks** tab and a **Hits** tab will appear in that window.
5. Click on the **Tracks** tab to get that menu.
6. Check the boxes for the Tracks or Segments you want to see (e.g. **MooreTracks**)
7. You can keep default settings or play with **Colors**, **Projections**, etc.
8. Click on the **Hits** tab to get that menu.
9. Check the boxes for the Hits you want to see (e.g. **MDT\_DriftCircles**)

## Navigating (A Few Examples)

More information:

- VP1 3D Viewer Pages: [ [html](#) ]
  - Group Meeting Presentation (15 Sep 2009): [ [pdf](#) ] [ [ppt](#) ]
1. There are four icons to the right of the viewing window. Hovering over the icons tells what they do.
    - ◆ Select the \*arrow for picking objects to get information
    - ◆ Select the \*hand for moving and zooming and other navigation
    - ◆ Select the \*eye to zoom back until everything is visible
    - ◆ Select the **flashlight** to choose rotation origin
    - ◆ Select the bottom **trapezoidal thing** to select perspective or orthographic mode
  2. You can use your mouse to navigate
    - ◆ **Left** mouse button rotates the detector and data
    - ◆ **Middle** mouse button displaces the detector and data
    - ◆ **Right** mouse button gives some options for viewing (anti aliasing gives nice pictures)
    - ◆ **Scroll** wheel zooms or unzooms
  3. There are four icons in the upper left under **Controls: 3DCocktail**. Hovering gives info.
    - ◆ **Far left** is full screen mode (**This broke my session!**)
    - ◆ **Info Symbol** gives contact information
    - ◆ **Camera** takes a snapshot and saves a .png file
    - ◆ **Printer** lets you print to a printer or a file

## Getting Muon Spectrometer Detector ID Information

1. Click on the **Geo** tab in the left-hand menu
2. Select the **Interactions** tab in the sub-menu
3. Check **Muon chamber info**
4. Select the **arrow** icon on the right-hand side (right of the image)
5. Click on the detector element for which you want to see info
  - ◆ The information will be printed in the bottom info window and to standard output.
  - ◆ Example:

```
[3DCocktail/Geo] ==> Selected Node: MultiLayerFoam
[3DCocktail/Geo] ==> Muon station <==
[3DCocktail/Geo]      Name: EML
[3DCocktail/Geo]      (Eta,Phi) index: (2, 3)
```

## References

- VP1  - Home Page
- VP1 Installation  - How to Install Latest Version
- VP1 Documentation  - Full Listing of Documentation
- VP1 3D Viewer Pages  - Details on Using Viewer

- [VP1Tutorial](#) - VP1 Tutorial
  - [StevenGoldfarbAthena](#) - Steve's Notes on Installing & Running Athena
  - [WorkBook](#) - ATLAS Computing Workbook
  - [WorkBookReconstruction](#) - ATLAS Workbook Reconstruction Recipe
  - [AGLT2.MuonReco](#) - Muon Cosmic Reconstruction Tutorial (Dec 2008)
  - [AGLT2.MuonVP1](#) - Muon Cosmic VP1 Instructions (Feb 2009)
  - [RecExCommonFlags](#) - Flags to be set for Reconstruction
  - [MuonDataRec\\_myTopOptions.py](#) - Top jobOptions for Muon Reconstruction
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#### Major updates:

StevenGoldfarb - 13 Jan 2009 (creation) -- StevenGoldfarb - 02 Feb 2009 (update for demo) -- StevenGoldfarb - 04 Feb 2009 (update to 14.5.1) -- StevenGoldfarb - 29 Jul 2009 (update to use version-specific installation) -- StevenGoldfarb - 2009-09-14 (MDT usage directions) -- StevenGoldfarb - 2009-09-15 (attached presentation) -- StevenGoldfarb - 2009-09-24 (added detector info section)

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This topic: Main > StevenGoldfarbVP1

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