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seismology

TICKER 3D USER GUIDE

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1 Introduction

Ticker 3D is a real time monitoring application to view seismic events moments after it is recorded by the IMS seismic system. The application is Java based, which differs from its predecessor, Ticker 2D, which is web browser based. The change was motivated by many customer requests to have the ability to view mine plans and events in 3D space. After investigating the possibility to add a 3D viewer to Ticker 2D, IMS decided to rewrite the Ticker software in Java, due to limitations of web interfaces. This solved many other complex problems that existed in Ticker 2D, such as updating mine plans and view points.

Both of the Ticker applications communicate with a server that acts as a form of data provider. In Ticker 2D a user accesses the server by means of a web browser, such as Internet Explorer (IE), Firefox or Google Chrome (see Figure 1). The server then bundles all the information (events, mine plans, sites for a specified view) in the form of an image and sends it to the client. The advantage of this approach is that a user only needs a web browser to access the data. However, since the server machine needs to do all the “hard work”, it may easily get overloaded if multiple clients requested information simultaneously.

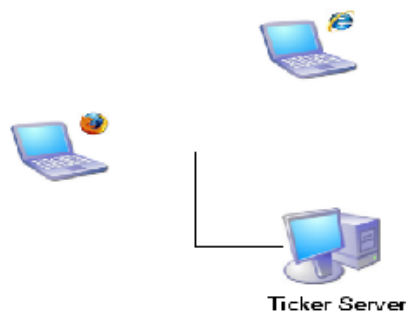


Figure 1: Ticker 2D server communication

The approach followed in Ticker 3D is slightly different such that when the client application firsts connect to the server, it downloads all mine plans, sites and viewpoints from the server onto the client PC. The server then only provides the client application with new event data. This means that all “hard work” in terms of image rendering is performed by the client machine, and prevents the server from becoming overloaded. There are several other advantages of this approach which will be highlighted in this guide.

Figure 3: Ticker 3D download page.



Figure 2: Ticker 3D server communication

Ticker3D was designed as an EASY-TO-USE tool for all users. First time users should find it easy to set up and navigate. It is important to note that this tool is not to be used as an analysis tool and advanced feature requests will not be implemented, as it may belong to different IMS software. A typical user would have little interaction with Ticker 3D and choose to rather sit back and watch the screen as new information becomes available. However, Ticker 3D also provides the ability for users to have a level of interaction if they want. These interactions are covered in this guide.

2 Getting Started

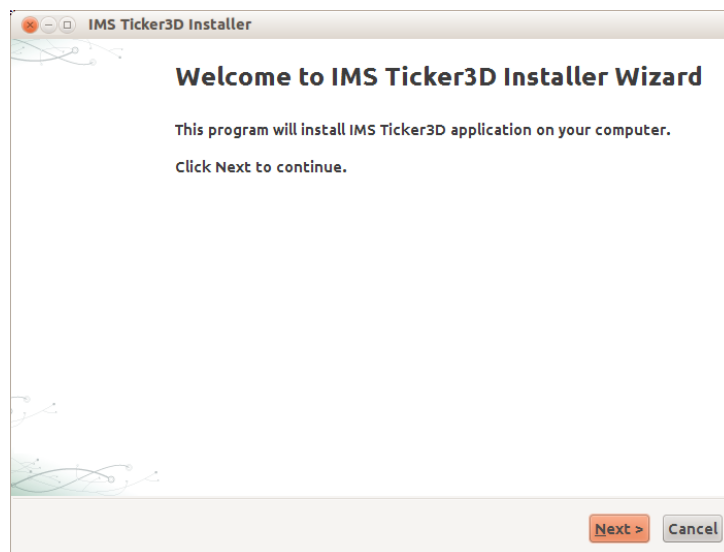
2.1 Downloading Ticker 3D

Installers for Ticker3D can be found on the IMS website at software.imseismology.org/ticker3d. There are four files listed on this page, each file name containing the date of the build as well as the operating system version (see Figure 3). Please note that no Apple Mac installers currently exists. Choose the correct file that applies to your operating system. Users containing 32 bit operating systems should download the files containing the “i386” character set whereas users with 64 bit operating systems should download the file containing the “amd64” character set.

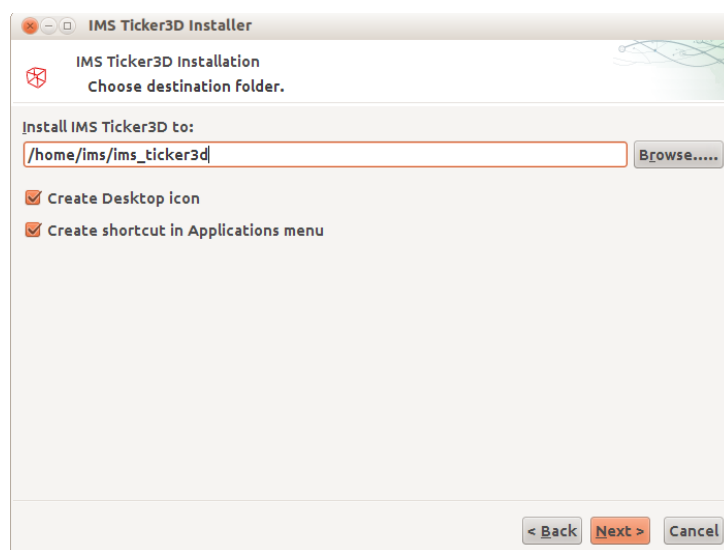
2.2 Installing Ticker 3D

Execute the file as described in Section 2.1.

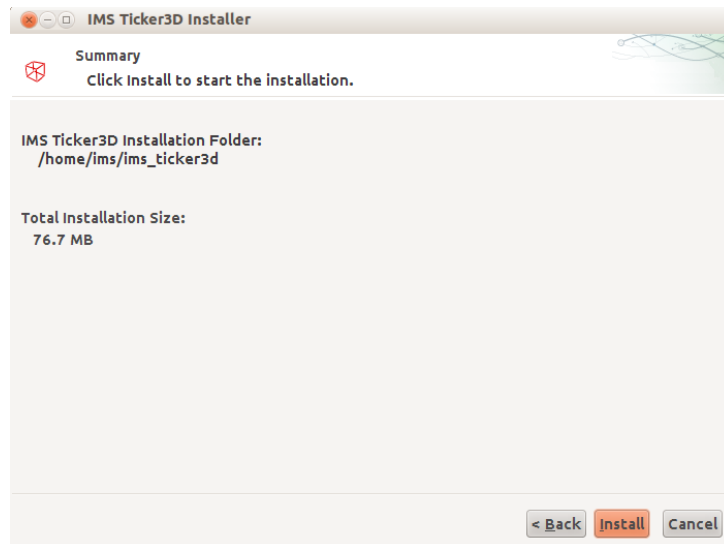
1. Select “Next” at the Welcome screen



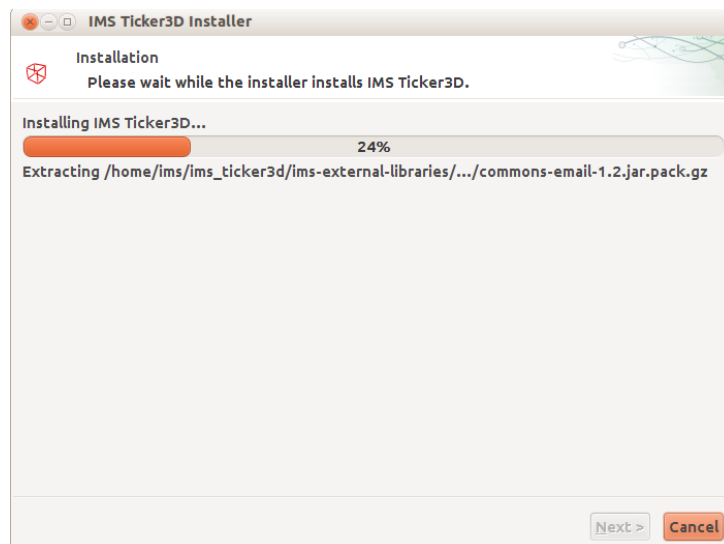
2. Specify the path where Ticker 3D will be installed and select “Next”. Windows users are encouraged to use the default path that refers to `c:\IMS\ims_ticker3d`. You can choose to create a desktop icon and start menu item.



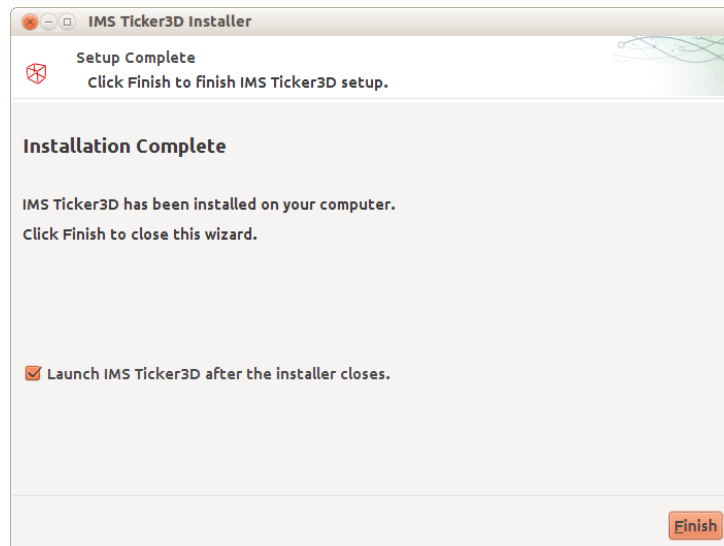
3. If you are sure that the path you specified is correct, select the “Install” button.



4. The application is being installed



5. The installation was successful. Make sure the “Launch IMS Ticker 3D after the installer closes” check box is selected if you wish to launch the application immediately after installation.



3 Running Ticker 3D for the first time

Ticker 3D needs the following information to function properly:

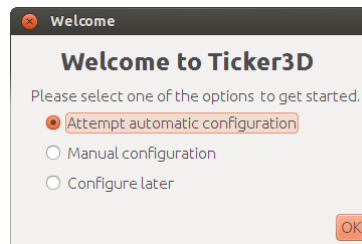
1. Ticker 3D obtains event data from a *Database Server*.
2. System health information is obtained from a *System Server*. For new generation IMS system Ticker 3D will connect to the Synapse Server and for older generation ISS systems it will obtain this information from an RTS server. Note that Ticker 3D can function without a system server. However, system health- and quick event information will not be available.
3. Loaded mine configuration. This includes mine plans, site information, levels and view points.

When you start Ticker 3D for the first time a license agreement appears.

1. Select “I Agree” to continue.



2. A welcome dialog appears that helps a user to set up Ticker 3D quickly and efficiently:



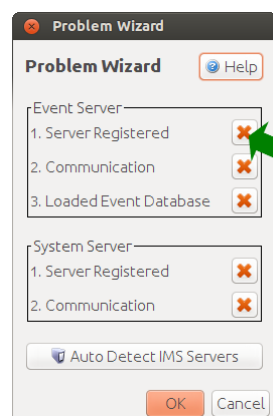
Automatic-configuration Ticker 3D tries to automatically detect all servers automatically and load the seismic database. In most cases this function works well, but in some cases IT limitations (Proxy settings, firewalls etc) may block automatic server detection.

Manual-configuration This takes the user to the Ticker 3D problem wizard to perform manual server registration

Configure-later This is for advanced users will perform configuration at a later stage

3.1 Problem Wizard

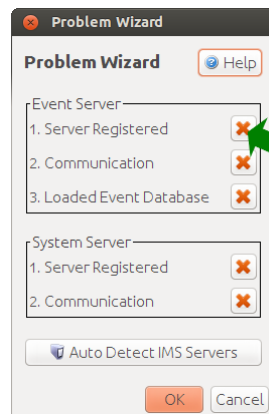
The Problem Wizard is a simple tool that can be used to determine if Ticker 3D has any connection problems. When running Ticker 3D for the first time, all items will be marked as a problem state (marked as “X”). A problem can be resolved by selecting the button next to the specified problem. Note that a “Communication” problem can only be resolved once the “Server Registered” problem has been resolved.



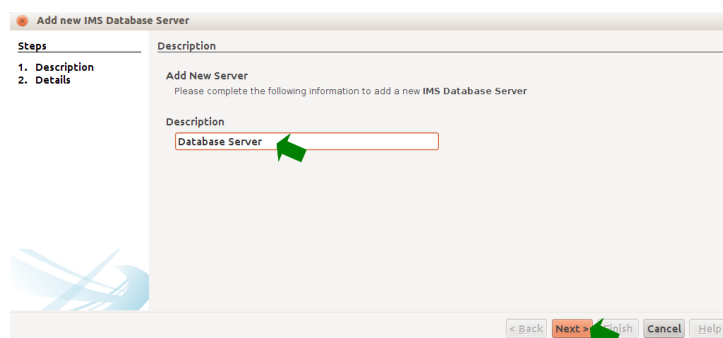
3.1.1 Manually Registering a Database/Synapse Server

This example will explain how to resolve the “Server Registered” problem under the *Event Server* section. The same steps are involved to register to a *System Server*.

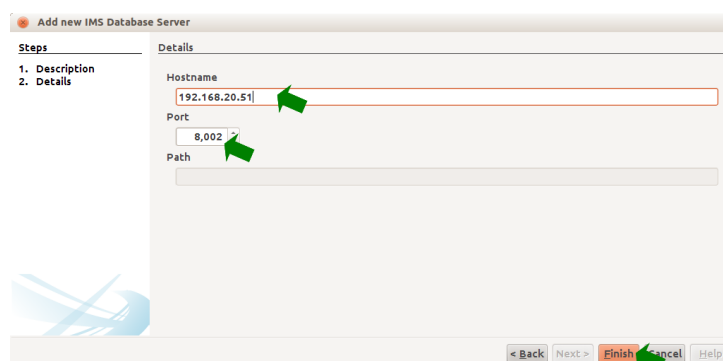
1. Select the button next to the “Server Registered” that is currently marked as a problem.



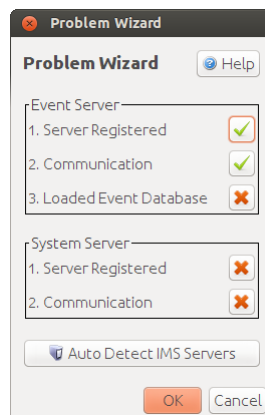
2. A simple wizard appears to aid the registration. A user may choose any name to complete the “Description” field. In this case we use “Database Server”. When finished, select “Next” to continue.



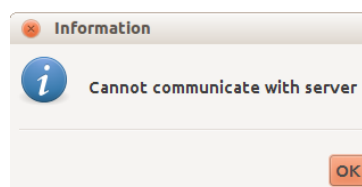
3. Enter the IP address of the server machine in the “host name” field (networks containing a DNS server can use the name of the server computer). The default port number for Database Server is “8002” and for Synapse Server is “8001”. In some cases the port numbers may change due to IT restrictions. Select “Finish” to complete the registration process.



4. If the entered IP address and port number is:
 - (a) correct, then the problem will be marked as “Resolved”.



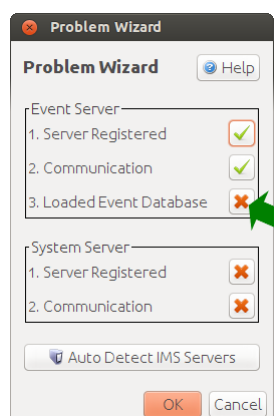
- (b) incorrect, then the following dialog appears. In this case the user must retry the registration steps starting at point 1.



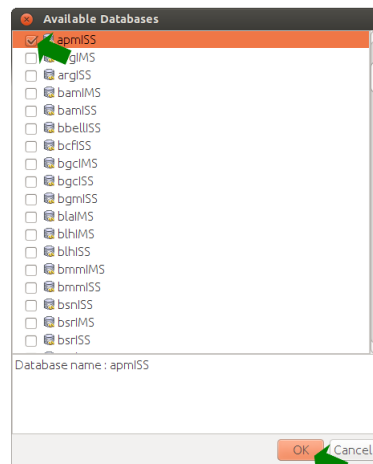
5. Follow the same steps as above to register a Synapse Server.

3.1.2 Loading event database

1. Select the button, marked as an problem, next to “Loaded Event Database”.



2. A window appears allowing a user to select a database. In most cases users will only have one option to choose from. However, in some cases there may be more. Select any of the available configurations and select “OK” to continue.



3.2 Restarting Ticker 3D after a completed setup

When a user runs Ticker 3D after the setup process in Section 3.1 has been completed, it will obtain communication to the registered servers and load configurations automatically. If however, Ticker 3D does not start automatically, it may mean that there are network issues, as the servers could not be reached. In this case the Problem Wizard may be revisited in the main tool bar.



The button on the far left is used to indicate the connection status to the Database Server. If no connection is available, then the “tick” in the button image will change to a “X”.

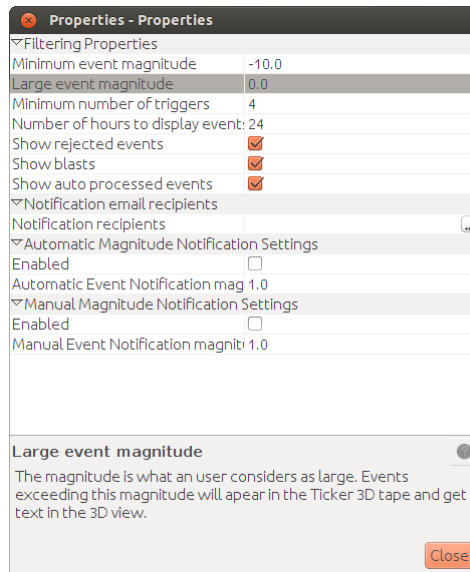



The health of the Synapse Server is similarly displayed.



The button displayed below indicates all settings that are shared between all users connected to the same servers. If a user changes these settings, it will affect all other users. Examples of shared settings are event filters and notification settings. When changing a particular shared setting, the user will be warned of the change. An example of shared settings is also shown below.





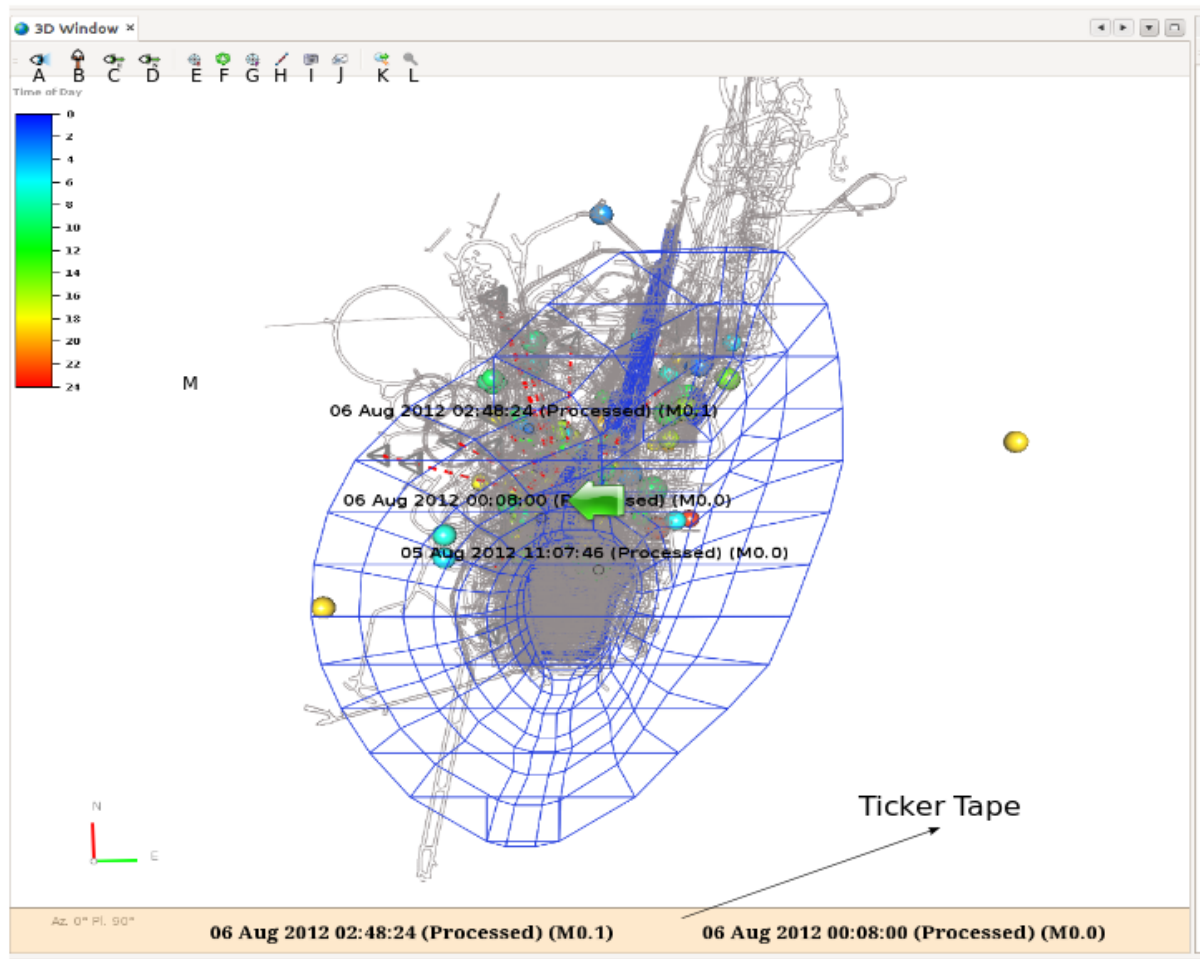
The button on the far right of the main tool bar is used to manage personal settings. Examples of personal settings are event sizes and colours in the 3D viewer. Personal settings are managed similarly to shared settings. 

4 The Application

4.1 The Viewer Window

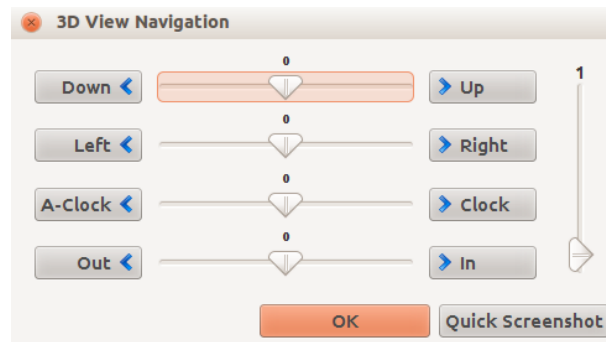
Ticker 3D has a fully functional 3D viewer that allows a user to get a good 3D perspective of the mine and its surroundings. The user can navigate in this viewer by selecting any area in the viewer and:

1. Left click + drag to rotate objects in the viewer.
2. Right click + drag to pan (move up/down/sideways).
3. Middle mouse click + drag to zoom in/out of a point. Zooming ability can also be activated by rolling the mouse wheel.



4.1.1 Buttons

- (A) Used to quickly go to a view point containing all displayed objects.
- (B) Go to plan view
- (C) Section view looking East
- (D) Section view looking North
- (E) Used to select a new focus point in the viewer
- (F) Manually change navigation by means of the below dialog:

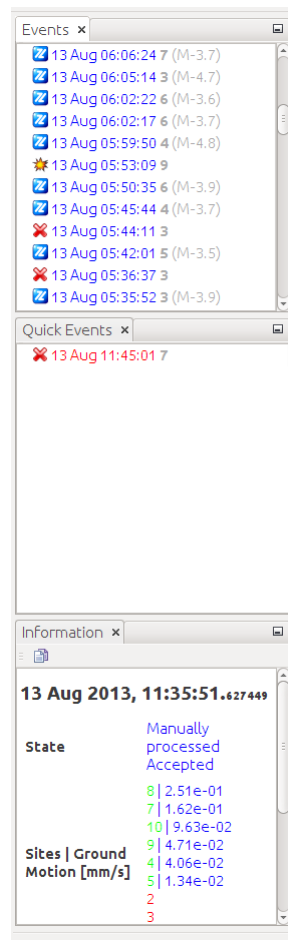


- (G) Point picker used to select points in 3D space
- (H) Length calculator used to calculate the distance between two points
- (I) Snapshot tool used to capture the contents of the viewer
- (J) Flip between orthogonal projection and perspective projection.
- (K) Jump to viewpoint tool (currently reserved for future use)
- (L) Save view point (currently reserved for future use)

4.1.2 Other information

- Text overlays: Large event information is displayed on the viewer
- Legend: displays the event colouring properties.

4.2 Events Window



Events are sorted by time where the newest event is at the top. Ticker 3D obtains new event information every 20 seconds from the Database Server. Definitions of icons and text colours are shown in the image below.

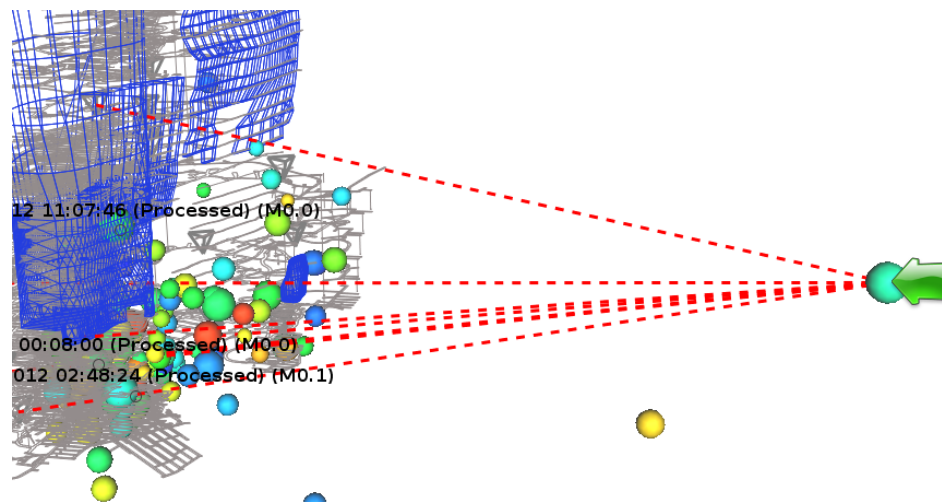
Icon Meaning

- Unprocessed Event
- Automatically Processed Event
- Manually Processed Event
- Manually Processed Blast
- Discriminated Blast
- Rejected Event
- Test Event
- Tap Test Event

Event Text Colour

- Unprocessed Event
- Automatically Processed Event
- Manually Processed Event

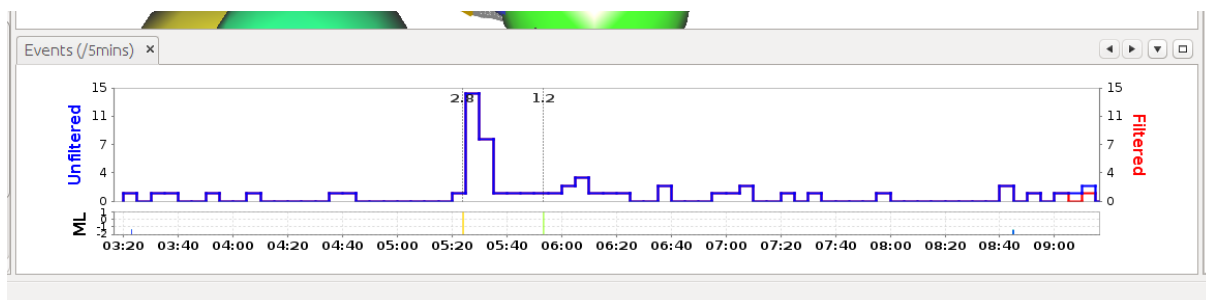
A user may choose to interact with events by selecting them. Event information will be displayed in the Information Window. The viewer as described in Section 4.1 will go to the selected event view point. An blinking arrow overlay appears and red lines are drawn to triggered sites (see below).



4.2.1 Quick Events

Quick events are events that are combined in the system memory right after it is recorded. Once all the triggers from the seismic system have been received, the event is stored in the seismic database and it can be processed. Some systems have slow communication and during seismically active times of the day (such as blasting time), it may take a long while for all the seismic event triggers to be transferred. Therefore quick event information is displayed in Ticker 3D. Please note that the locations and magnitudes of these events are unreliable and they merely act as a quick estimate of the event information. A user can also interact with quick events to get information.

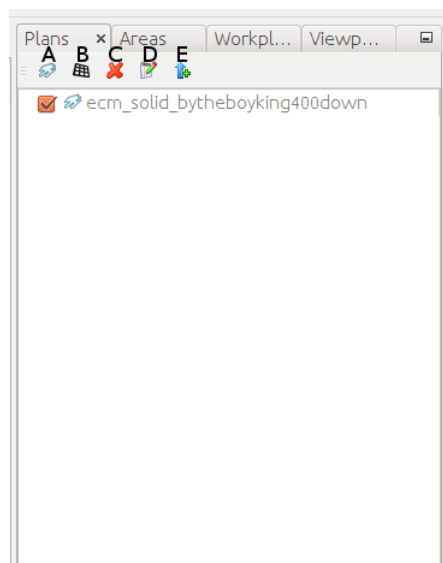
4.3 Activity Window



The Activity chart is used to give a user an idea of seismically active periods in the day. This chart shows the seismic activity trends of unfiltered data (left axis) as well as filtered data (right axis - event filters that the user may have created) using the last six hours of seismic data. Each data point on the chart represents the number of events that occurred within a 5 minute window. The grass bar chart at the lower part of this window indicates the size of the seismic events in the same period. Warmer colours indicate larger magnitude events whereas colder colours indicate smaller magnitude events. Events that are smaller than ML -2.0 do not appear in the grass chart.

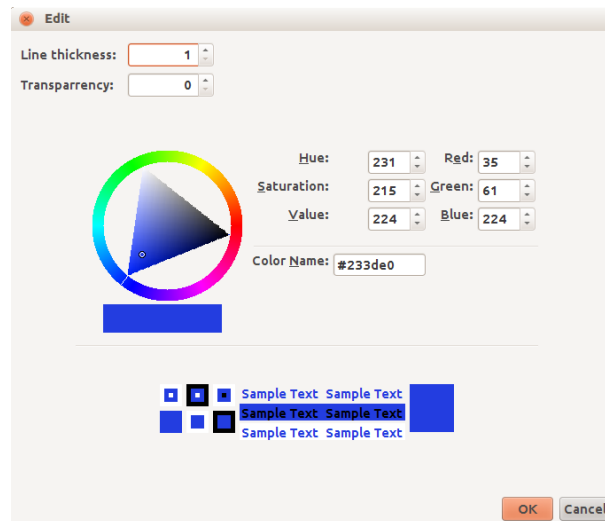
4.4 Plans Window

The Plans window shows all mine plan information currently loaded from the configuration files. A user can uncheck the boxes to hide plans in the viewer.



4.4.1 Buttons

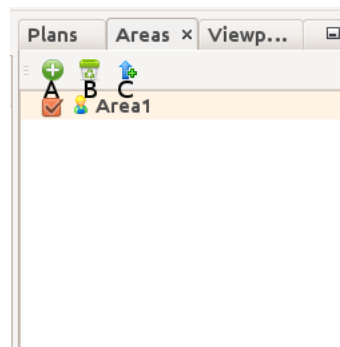
- (A) A user can import line files representing mine plans. Current supported file formats are (.pnt, .bln, .str). These files will be added to your local configuration files, and will not automatically be uploaded to the server. This means that other users will not have the same plans. The plans can be uploaded by selecting button of (E).
- (B) A user can import wire frame files representing mine plans. Current supported file formats are (.msh, .bmg, .dgn). These files will be added to your local configuration files, and will not automatically be uploaded to the server. This means that other users will not have the same plans. The plans can be uploaded by selecting button of (E).
- (C) Delete mine plans. A user can select the plan he chooses to delete, followed by button (C).
- (D) Edit mine plan display properties. A user can select the plans, followed by (D) to get the following dialog that allows a user to change plans colours, thickness and transparency:



- (E) Upload your local plans to the server. The server copy will be erased, and updated with your local copy.

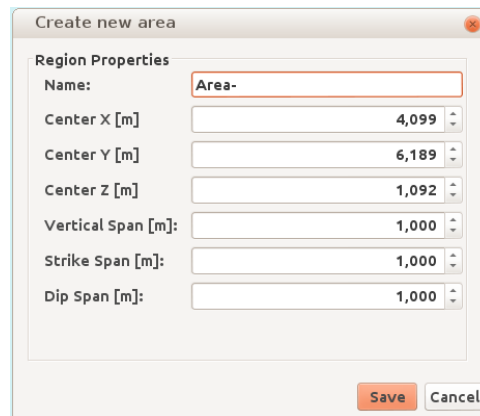
4.5 Areas Window

A user can define areas for different parts of the mine. An area is defined by a rectangular area. When an area is selected, only information inside will be displayed.



4.5.1 Buttons

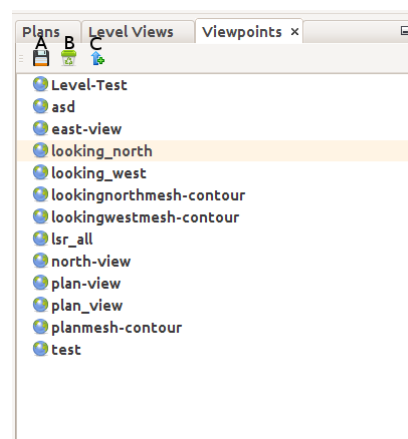
- (A) Used to define a new area. A dialog defining the area properties will appear:



- Specify the level name.
 - Specify the coordinate of the area.
 - Specify the dimensions of the area.
- (B) Delete an area. A user can select the area he chooses to delete, followed by button (B).
 - (C) Upload areas to server. The server copy will be erased, and updated with your local copy. For other users to obtain this copy, they must select the synchronize button as described in Section 3.2.

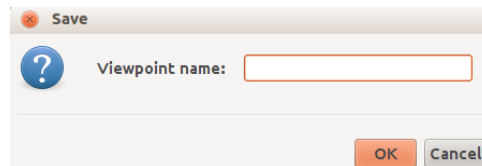
4.6 Viewpoints Window

A user can define a set of view points to easily navigate between different views in the viewer. By simply selecting the view point, the viewer will automatically go to the save view point.



4.6.1 Buttons

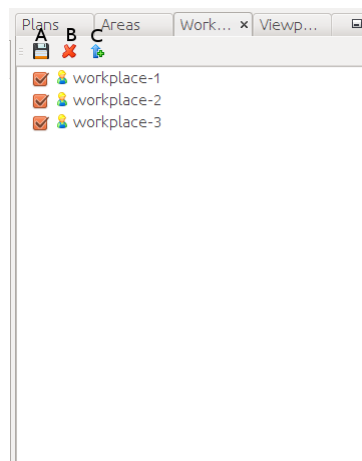
- (A) A user can save his current viewpoint shown in the viewer. A dialog appears to specify the view point name:



- (B) Delete a view point. A user can select the view points he chooses to delete, followed by button (B).
- (C) Upload view points to server. The server copy will be erased, and updated with your local copy.

4.7 Workplaces Window

Workplaces are areas in the mine where current mining activity is taking place. By defining workplaces, event information will automatically display the distance to the nearest workplace. Workplaces can also be added to the viewer by enabling the check box next to the specified workplace.



4.7.1 Buttons

- (A) A user creates a new workplace. A dialog with general workplace information must be completed to add the new workplace. The “From Viewer” button can be selected that allows the user to select a point in the 3D viewer where the workplace is located.

- (B) Delete a workplace. A user can select the workplaces he chooses to delete, followed by button (B).
- (C) Upload workplaces to server. The server copy will be erased, and updated with your local copy.

4.8 System Window

The System window is used to get a quick overview of the health of the system. For more advanced information please refer to Synapse. Each component of the system will be listed in the window where components that have green icons indicate good health and components with red icons indicate some problem. A user can select the component to obtain a quick overview of the health of that component in the information window. Note that if this service is available, sites in the viewer will be coloured according to its health. Sites that are coloured in grey implies that no information is available.

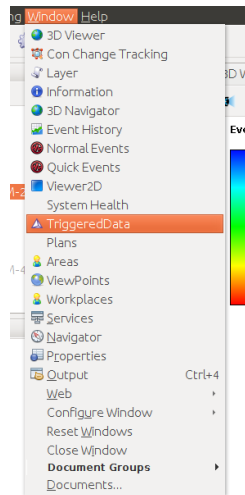
Sites	Net ADC	Net SP
▲ S2	GS100210	GS100210
▲ S1	GS100210	GS100210
▲ S3	GS100210	GS100210
▲ S6	GS100210	GS100210
▲ S5	GS100210	GS100210
▲ S4	GS100210	GS100210
▲ S7	NA8120123	SPP120060
▲ S8	NA8120123	SPP120060
▲ S9	NA8120123	SPP120060
▲ S10	NA8120123	SPP120060

4.9 Triggered Data Window

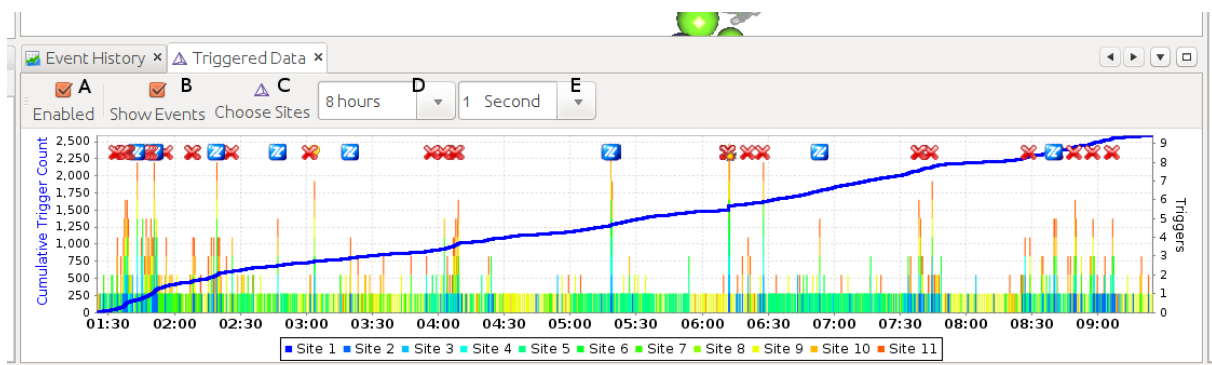
The purpose of the Triggered Data Window is to give a user an overview of unassociated data. In seismically quiet periods this information can be used to determine if there is any response from the system. For example, by default at least four sites have to trigger

simultaneously for an event to be associated. This means that for sparse systems the size of the event has to be large enough to trigger at least four sites. However, small micro cracks near a particular site might cause only that particular site to trigger and no event will be associated. This information can be viewed in the Triggered Data Window.

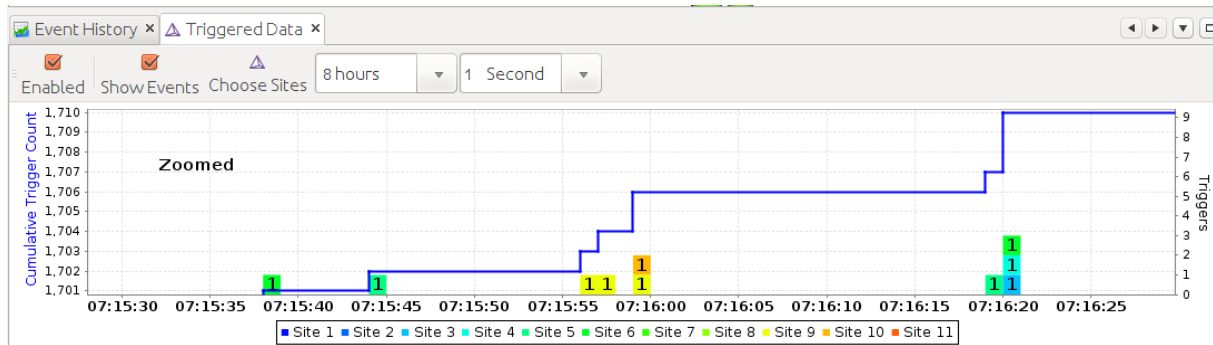
By default the Triggered Data Window is not active. To activate it select Window - Triggered Data.



This will open a new window in the lower-center part of Ticker 3D.

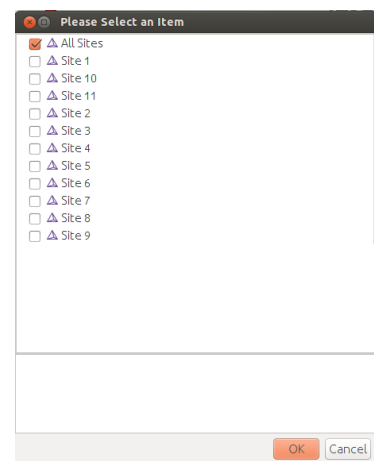


Each site of the system is represented in this graph by a colour. If a particular site triggered at a certain time, then a bar representing the colour of the site will be drawn. A user can zoom into a particular time period by leftclick + dragging on the graph to look at the data more closely (see below). To remove the zoomed view simply rightclick on the graph.

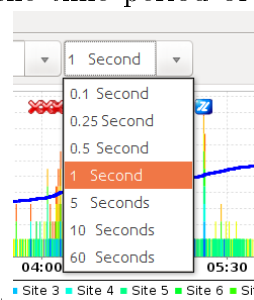


The buttons found on the toolbar of this window represents:

- (A) Enable or disable this feature. A user may choose to disable this feature over a slow internet connection as large amounts of data may be downloaded from the server
- (B) Show event icons on the graph. It may be useful to plot event icons on the graph to get an idea of when events were associated from the data. However, in seismically active periods this may clutter the graph and a user may choose to disable the feature.



- (C) Choose only certain sites or site groups to display.
- (D) Choose the time period of the data. By default this graphs shows the last 8



hours of data

- (E) Choose the time interval of a bar. Each bar on the graph represents a time period. This means if a site triggered in a particular time period a bar for that site will be displayed.