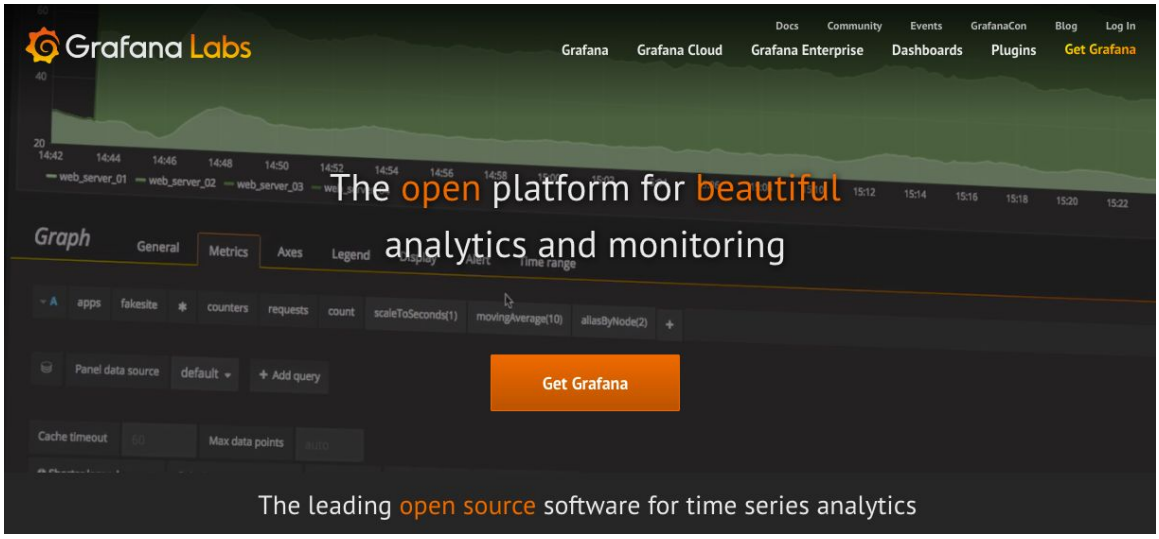
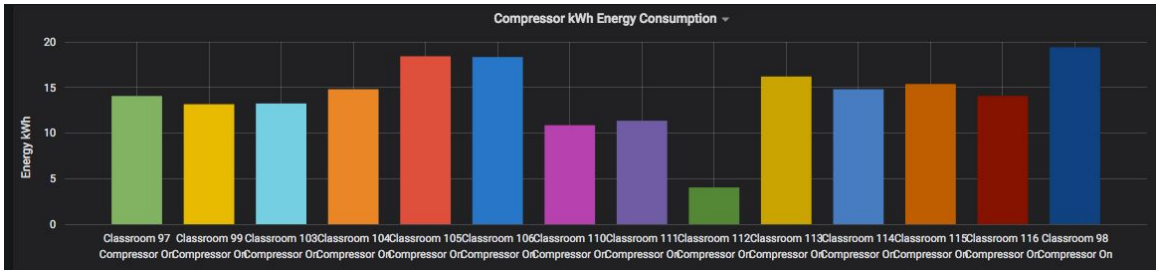
Grafana

IRIS Buildings uses Grafana for visualization, alerting, and diagnostics.

Grafana Open Platform runs within a browser using the Node.js library, an open-source, cross-platform JavaScript run-time environment that executes JavaScript code outside of a browser. I does not rely on repeated screen refreshes but rather . Screen updates are very fast. Update times depend on the amount of data to be refreshed. Twenty four hour data refreshes are fast. Previous month data refreshes can take up to 30 seconds, depending on how many graphs and internal SQL queries on a single dashboard. Grafana uses a separate database for caching collected data and annotations.



Grafana delivers data visualization through multiple *dashboards* running within a browser. Dashboards contain *panels* for graphic strip charts, embedded documents, and support content. Panels are managed either through mouse clicks or keyboard strokes (i.e. keyboard “v” to blow up graphic to full screen).



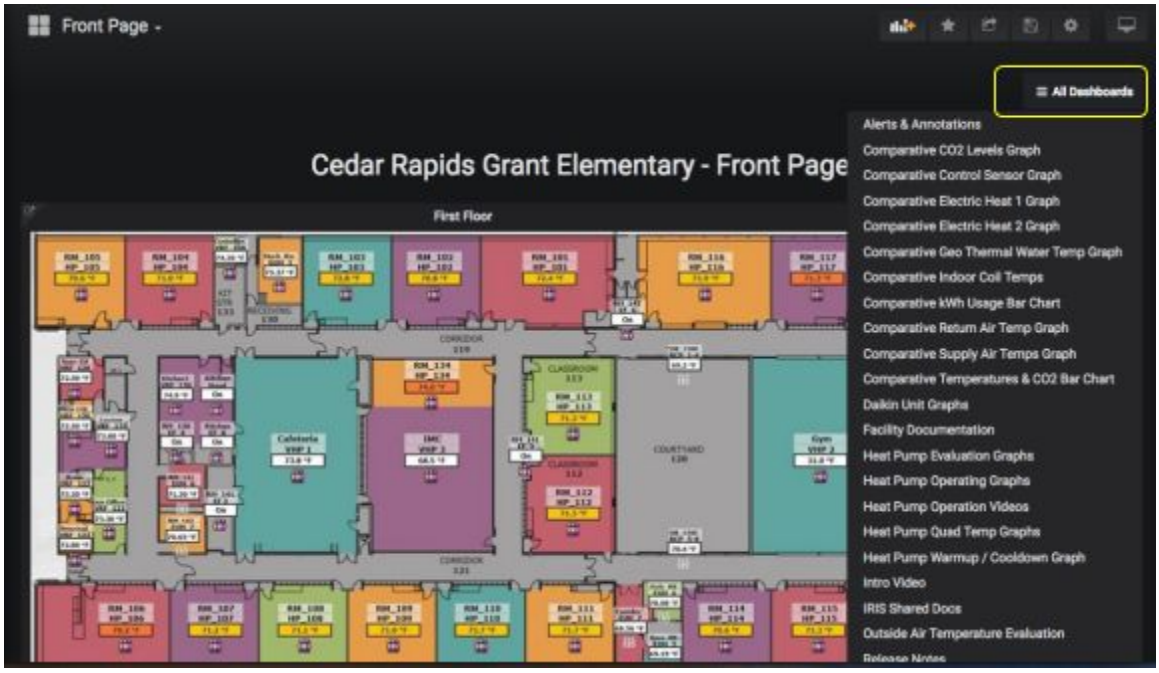
Grafana Panel Example

Grafana system programming is provided by IRIS Buildings based upon expertly analyzed collected data. Equipment alerts are built within Grafana using observed equipment operating conditions. Alerts log internally and are delivered by email to interested parties.

The system can collect data for several years. Software runs on a Raspberry Pi and is accessible through secure, open, or local in-building IP connections. Grafana access is controlled through logins and passwords for editing and view-only privileges. Building collected data typically ranges from 500 to 2,000 points on 2 minute intervals.

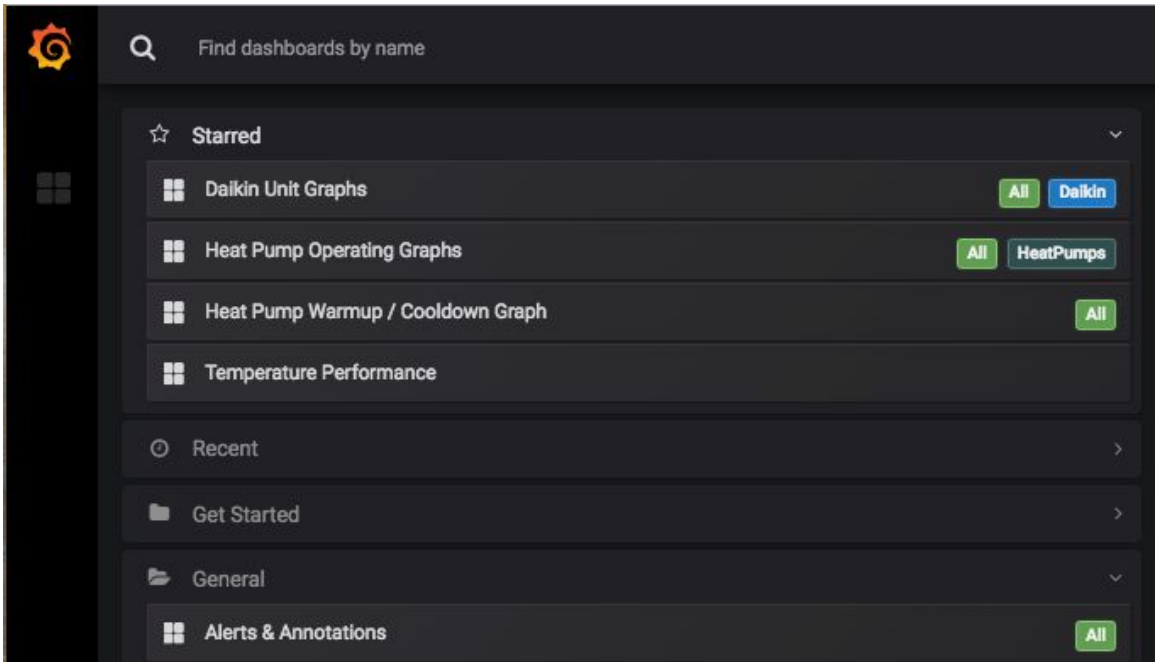
Navigation

Grafana runs within a web browser and functions as its own dashboard browser. Click on All Dashboards (upper right corner) for a dashboard navigation list.



Too see a complete list of Dashboards click on the upper left quad icon.

Only dashboards using the All tag appear in the All Dashboard list.

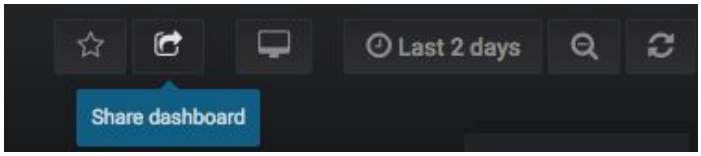


The initial dashboard defaults to Front Page.

Scroll down Front Page for a brief site overview.

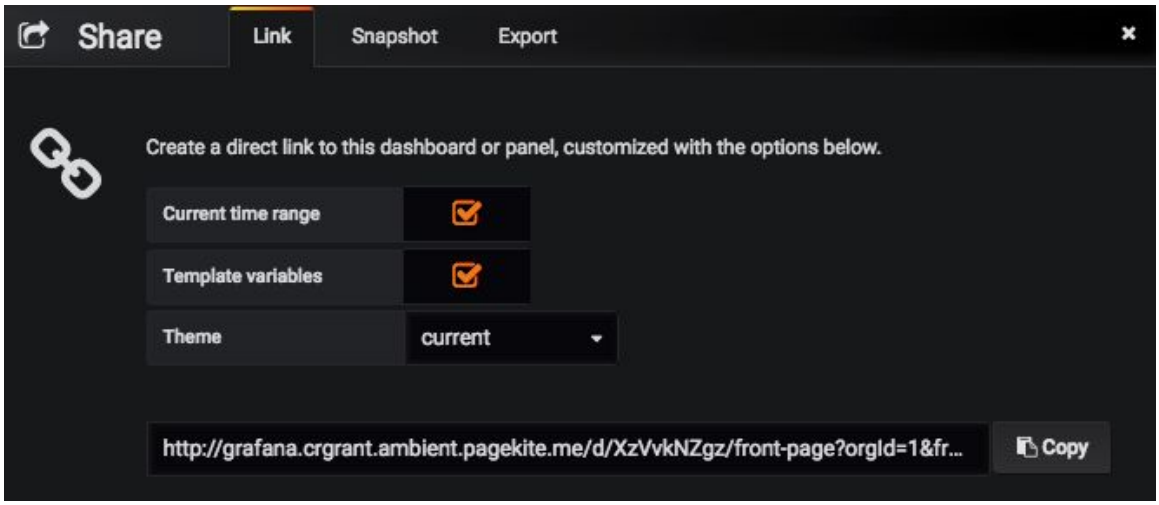
Dashboard sharing

Grafana allows dashboards (containing multiple panels) or a single panel to be shared.



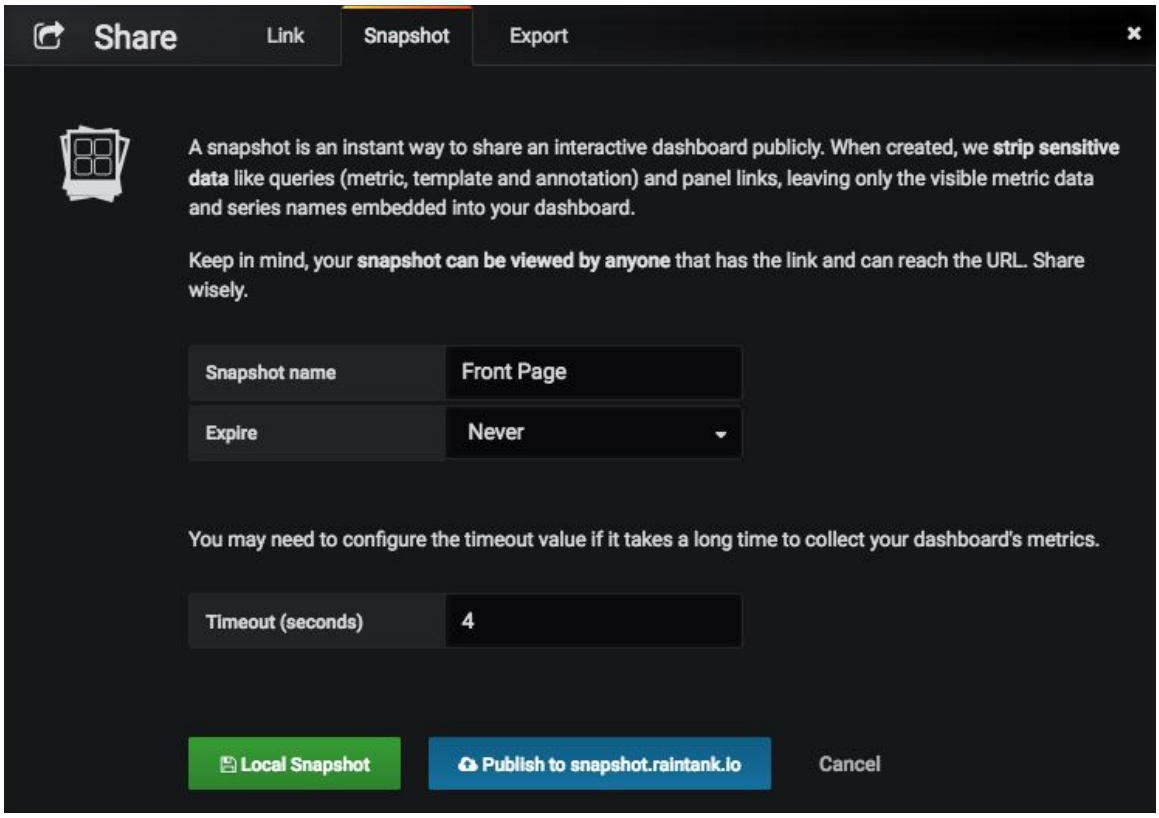
Share brings a dialog window that provides for three options.Hyperlink is to a dashboard (users will need appropriate permissions). Select whether it is to include the current time range (usually) and whether or not template variables are passed along (depends on how the dashboard is setup).

Click the Copy button to use in a separate browser tab. Sharing provides for a *fully operational* dashboard to be accessed by others.

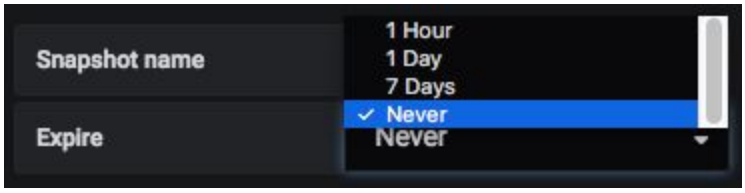


Snapshot Sharing

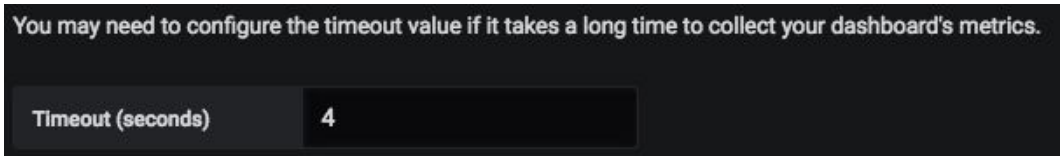
The second option creates a Snapshot. Snapshot names are automatically filled in using the current dashboard description. Snapshots can be captured to the Grafana host server “snapshot.raintank.io” of for use on a local Grafana server (depending on permissions wanted).



Snapshots have a time-to-live on the raintank.io server. Best practice is specify a length of time that meets your immediate sharing needs. Snapshots with “Never” will never be deleted. (If you accidently include confidential information in a Snapshot contact Grafana tech support by email to have it remove.)



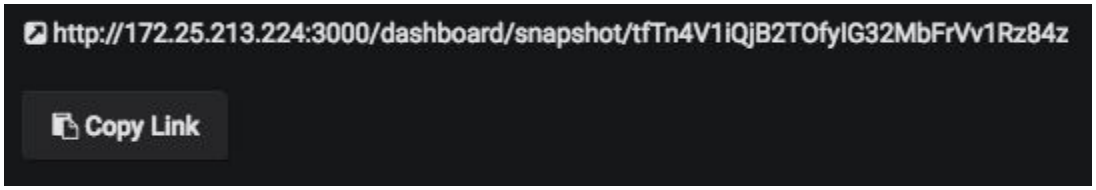
Timeout can be important. The timeout function is that time needed for the dashboard to completely refresh all queries. For some large dashboards that ranges from 5 to 30 seconds. Pick a number and try it. If the resulting graphic does not include all the data then choose the “erase” option, set the timeout to a longer period and try again.



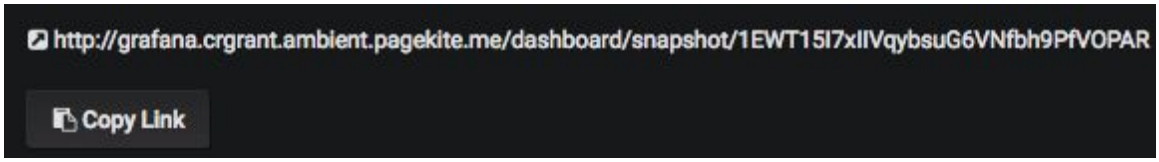
Snapshot publishing

Snapshots can run on either your local Grafana server or the Grafana-hosted public server. Snapshots are *not* screen grabs. Instead Snapshots are complete interactive dashboard views.

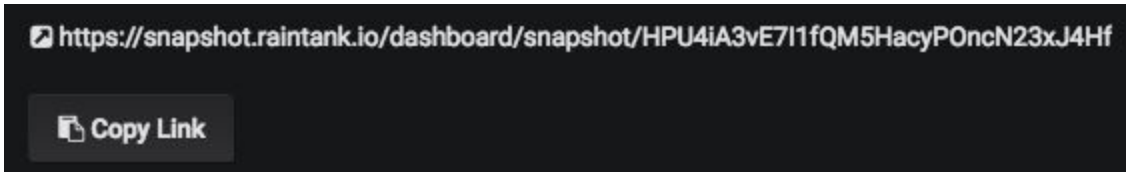
Choosing Local Snapshot creates a link using a secure connection (Zerotier). The person using this link must have a valid Zerotier account (by IRIS Buildings). Encrypted connections provide the most secure method for sharing Snapshots. Note the use of a non-routable IP address for Zerotier.



For Local Snapshots running on Pagekite reverse proxy (by IRIS Buildings) any outside user can access the Grafana server on the Raspberry Pi.

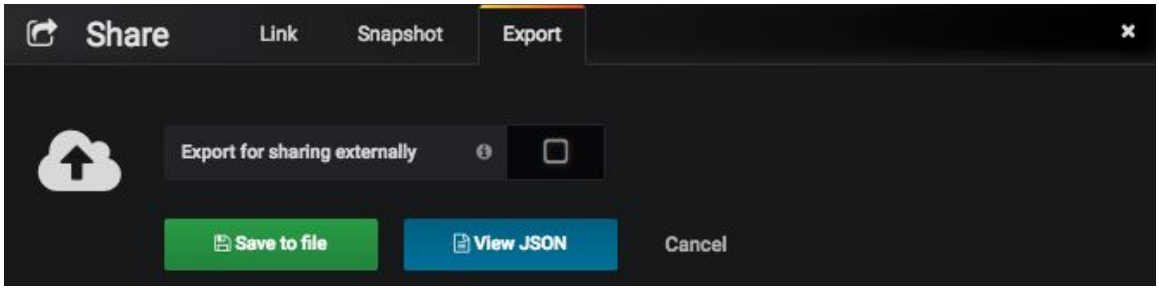


Otherwise the publically accessible Raintank.io link looks like this.



Other options include running Grafana on a cloud server where it accesses realtime data over an encrypted connection (Zerotier) running on the Raspberry Pi.

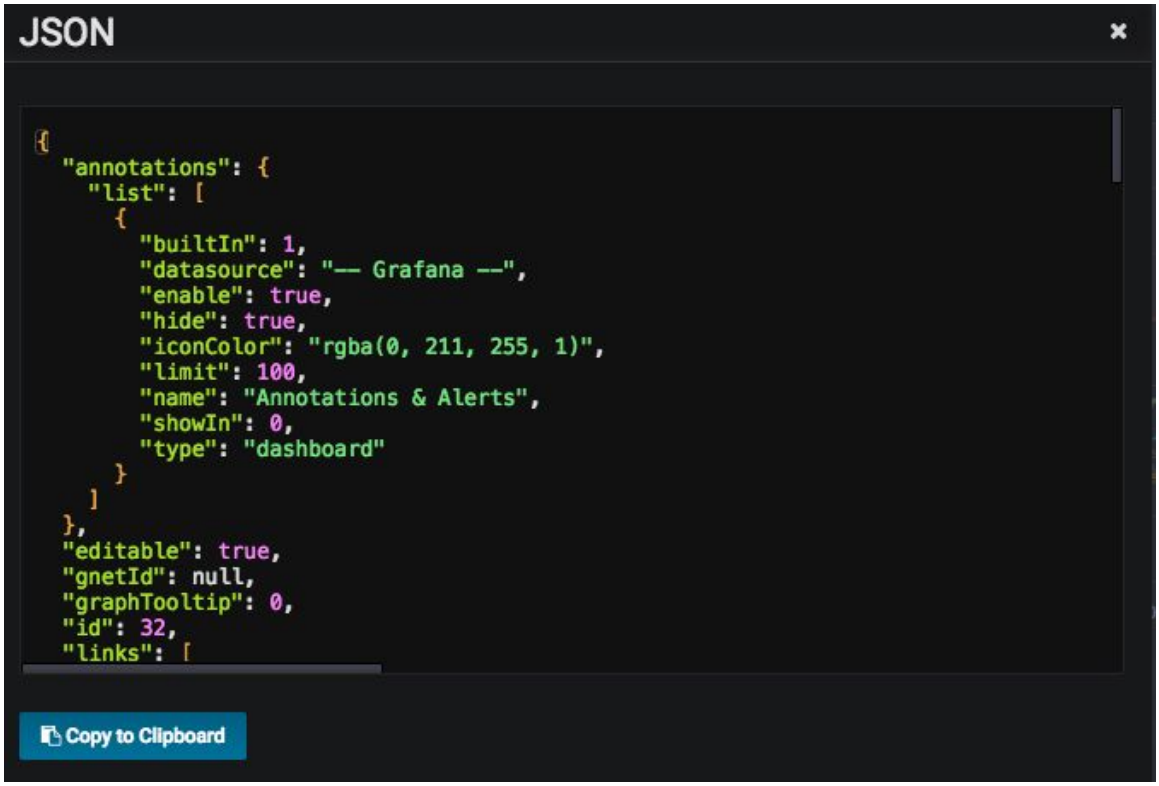
Grafana can also share by saving a dashboard or panel to a file as JSON code.



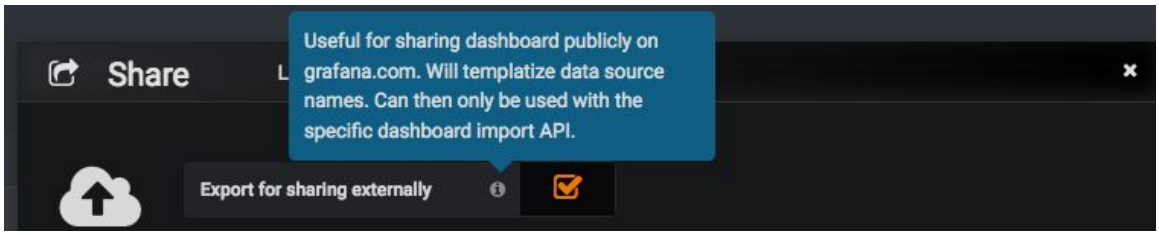
Saving to file produces a JSON file: *Comparative CO2 Levels Graph-1545504199213.json*

Saving Snapshots in JSON

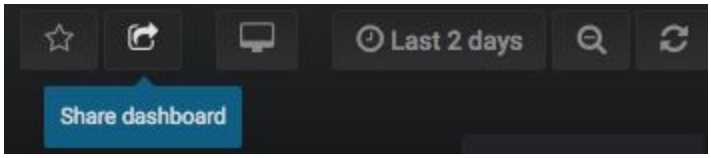
Otherwise view the JSON file, which completely describes the dashboard or panel. Use the Copy to Clipboard feature to create a duplicate dashboard or panel entirely (requires editing privileges - visitors are view-only).



A third option is to send dashboard information to grafana.com so that it can the “import API” feature of Grafana. It’s possible to share an entire site with other users this way.



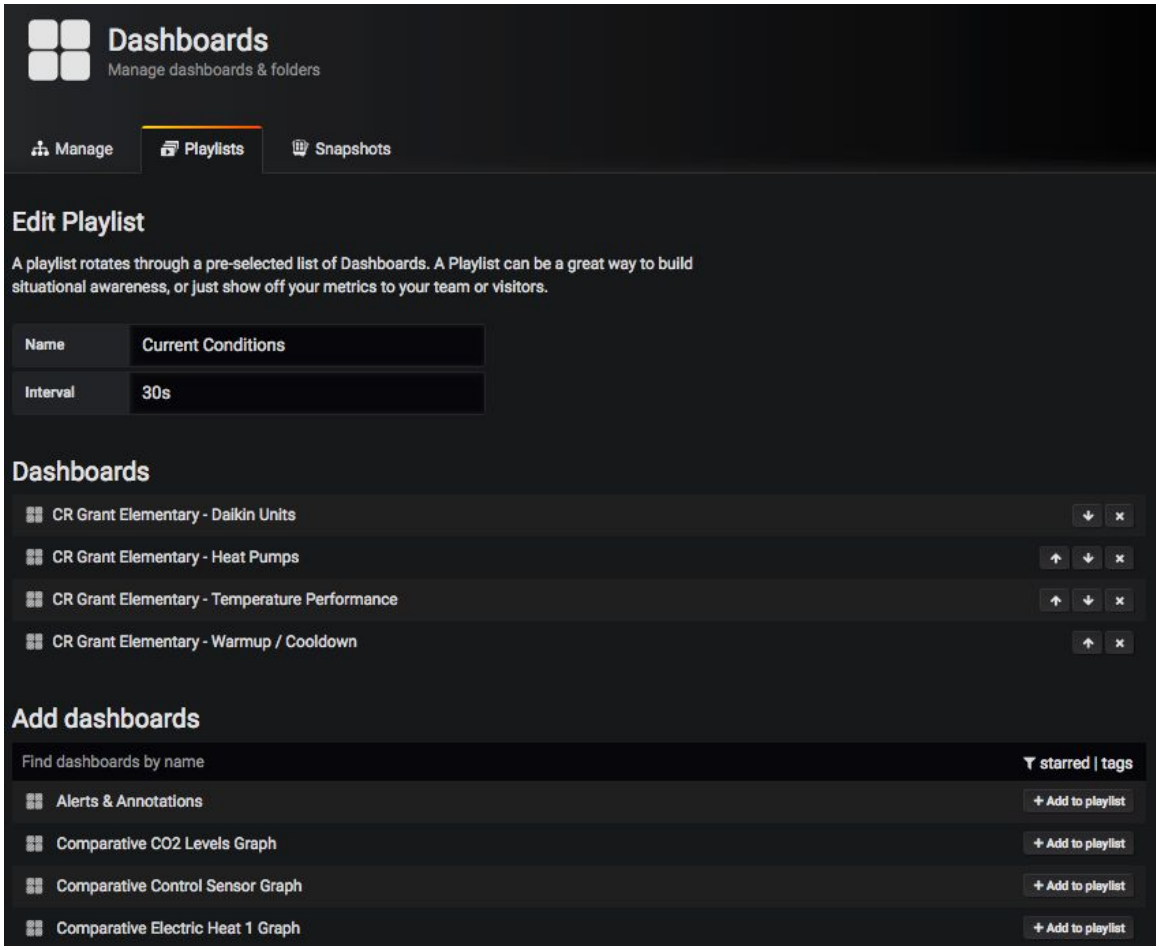
Grafana also provides a Kiosk view where viewser do not see some of the options.



Kiosk views offer a simplified sharing opportunity for one or many processors.

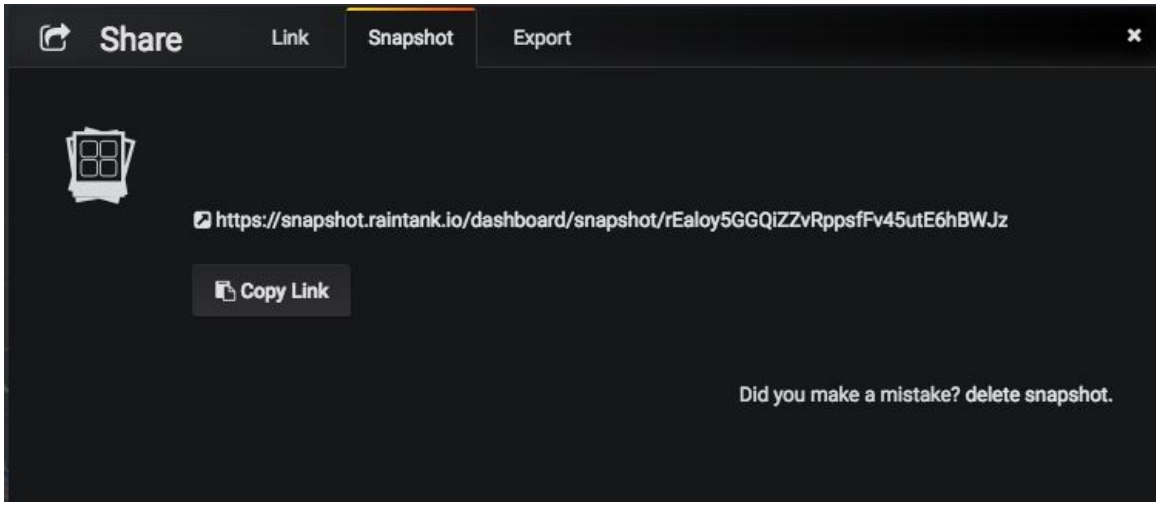
Rotating dashboards

To support rotating dashboard views Grafana provides the ability to pick dashboards for the rotation under Playlists. This allows for live dashboards to continually rotate on a screen with realtime data. IRIS Buildings can supply Raspberry Pi's that attach to a flat screen monitor or TV to provide continuous building update information.



Snapshots are live

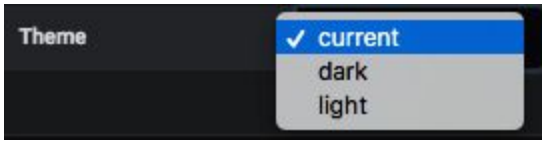
Snapshots are complete standalone dashboards or panels. In this Snapshot click Copy Link, open a new tab and try it. If this is not what's expected, click "Did you make a mistake? Delete Snapshot." Once this screen is exited, however, this live screen can no longer be deleted on the snapshot.raintank.io server.



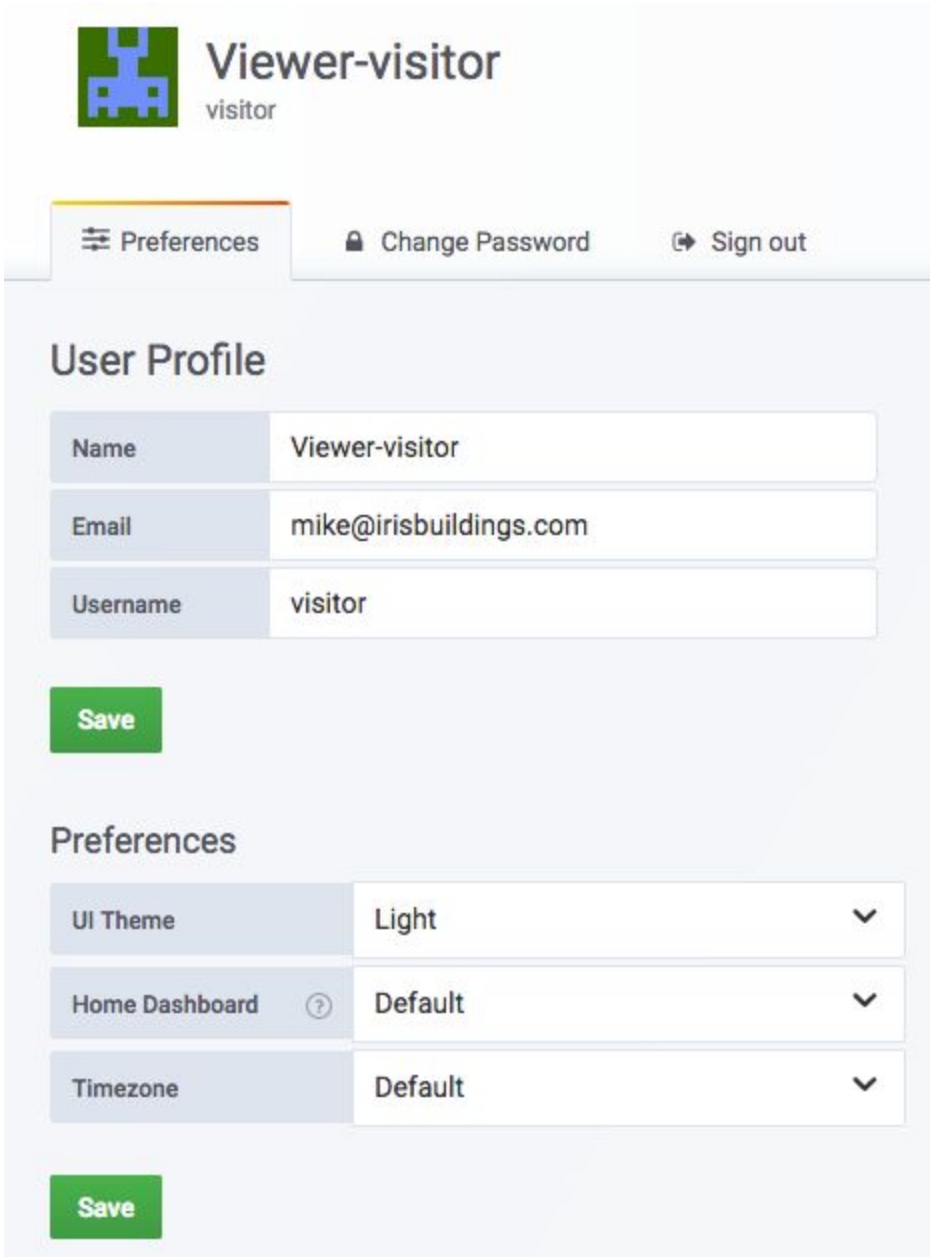
In this example the screen below is now available with full interactive viewing. Users will be able to go backward or forward in time to the extent included in the Snapshot. Where users might want to go back in time, say the previous 30 days (or even more), requery the panel with the appropriate time boundaries and set the Timeout long enough to capture all the data. Grafana provides Snapshots as a free service.

Themes

Grafana operates with one of two themes.

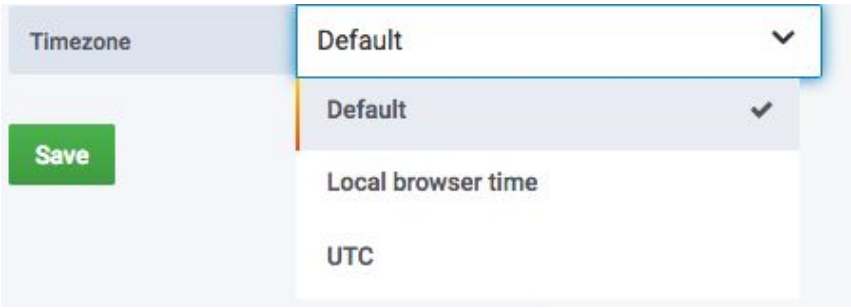


Users can choose a “light” theme alternative within their preferences. If the login is general, such as “visitor” below, changing the theme or password will affect anyone else logging in as “visitor”. Individual user names with login/password are available for setting individual preferences. Otherwise general viewing of the Grafana site is set up as “anonymous” where access to user profile is unavailable.



Time zones

Grafana provides for two time zone selections: Local browser time and UTC



For users located in different time zones, setup UTC appropriately. Alerts use UTC time exclusively (i.e. 06:00 EST is 11:00 UTC). Defaults for time zones and Home Dashboard are included within the initial system installation.