



# conTZole

An Interactive ATLAS Tier-0 Monitoring

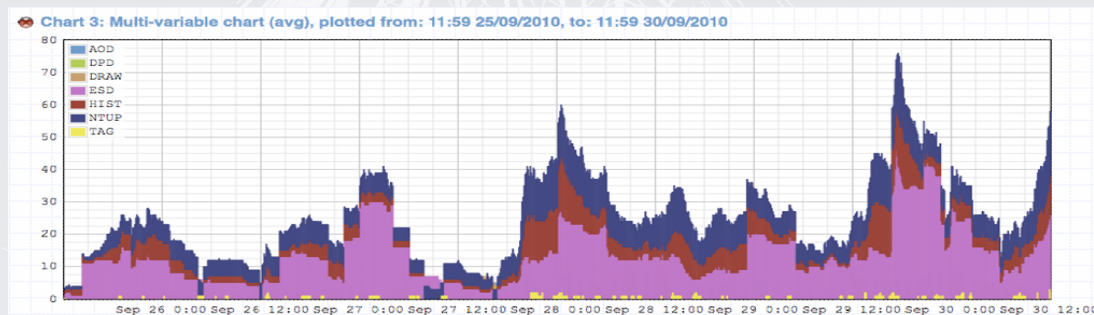
Tomáš Kubeš, 2010

[tomas.kubes@cern.ch](mailto:tomas.kubes@cern.ch)

[atlas-tz-monitoring.cern.ch](http://atlas-tz-monitoring.cern.ch)

# conTZole Purpose

- ATLAS Tier-0 web based graphical interactive monitoring and control system
  - For common Tier-0 operations
  - For shifters
  - For ATLAS members
- **[atlas-tz-monitoring.cern.ch](http://atlas-tz-monitoring.cern.ch)**



# conTZole Design Principles

- Interactive user interface – User can adjust it and see new data without losing changes
- Graphics is rendered at the client side, server provides data in an interchangeable format
- Real time system driven updating
- Reliability + error resilience, dependability



# conTZole Components

web based services

- **Monitor** – Tier-0 processing workflow overview, global view of Tier-0 health
- **Task Lister** – Task and job level view with history, details and operations
- **Dataset Lister** – Dataset view, sorting, history
- **Miscellaneous** – Charts, statistics, data export

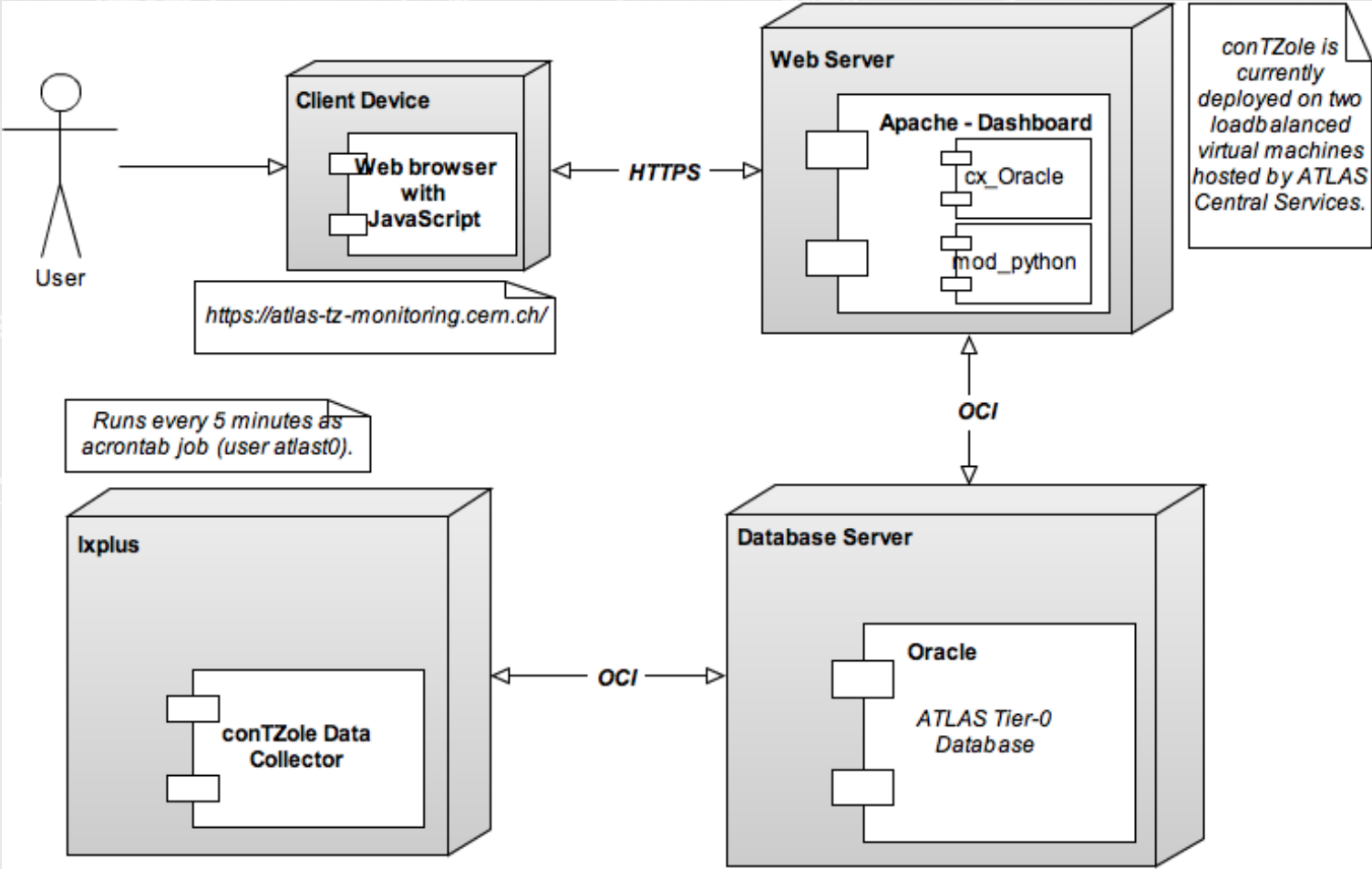
back-end

- **Server** – Backend for web components
- **Data Collector** – Saves aggregated snapshots

# conTZole Deployment Diagram

web based services

back-end





# conTZole Technology

- Server

- Built using ARDA Dashboard framework  
(httpd) Python, mod\_python, cx\_Oracle, Apache



- Client (Web Browser over HTTPS)

- XHTML, JavaScript, jQuery, flot  
(Data presentation)

*AJAX = Asynchronous JavaScript and XML*



- Data Collector

- Python, cx\_Oracle



# conTZole Web Applications

- Static web page served to the client.
- JavaScript machinery is initiated.
  - Keeps track of time, asks for new data periodically.
  - Data are usually refreshed per object.
- Technologies
  - jQuery – <http://jquery.com/>
  - flot (plotting) – <http://code.google.com/p/flot/>
  - XMLHttpRequest (obsolete with jQuery)  
<http://www.ilinsky.com/articles/XMLHttpRequest/>

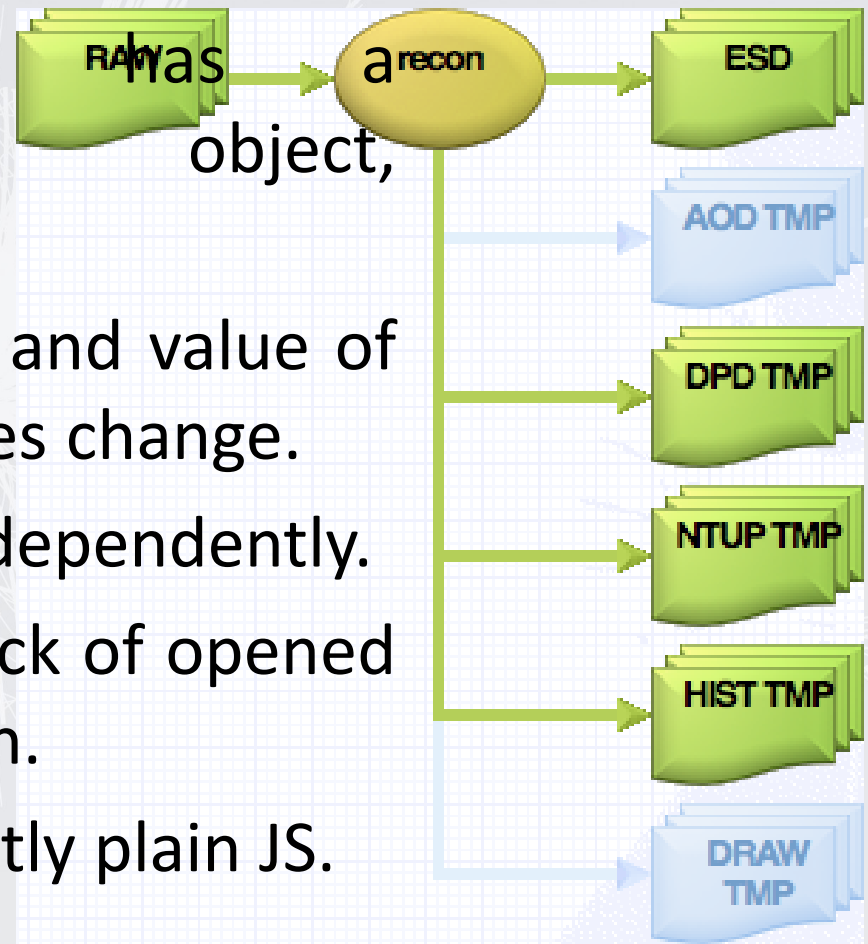
*AJAX = Asynchronous JavaScript and XML*





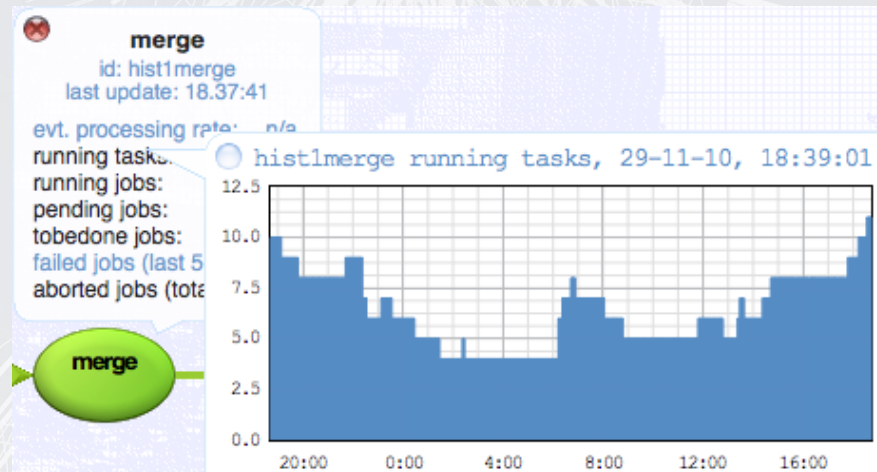
# conTZole – Monitor

- Each DOM object has JS “mirror” keeping its values.
- Central clock keeps time and value of the last update, announces change.
- Each object re-spawns independently.
- Central register keeps track of opened charts and triggers refresh.
- Heavy on AJAX, code mostly plain JS.



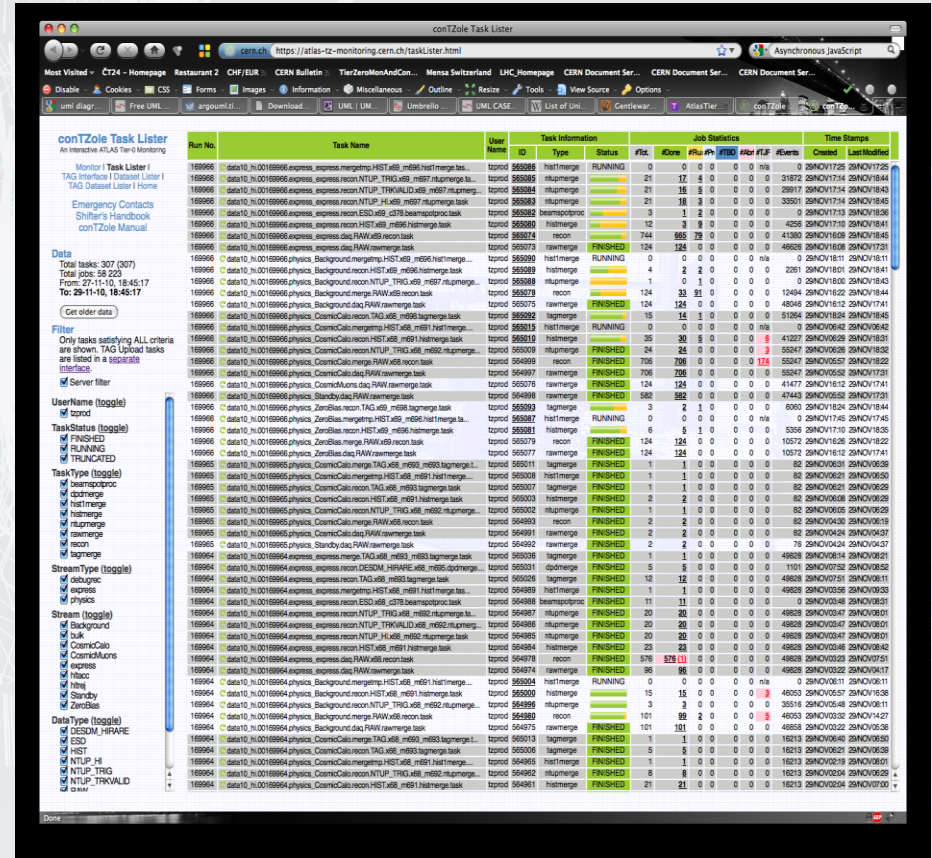
# conTZole – Monitor – Usage

- High level of user interactivity
  - Shifter can create his own “monitoring page”.
- Automatically refreshed every 5 minutes.
- Connection or server problems logged + displayed.



# conTZole – Task Lister

- Bulk data fetching + incremental updates
  - New rows (every 2 min)
  - Changed rows
- Interactive filter
  - Real time display
- Details about every job
  - State, log, actions
- Possibility to get older data (unlimited).





# conTZole Miscellaneous

## Other Web Based Tools

- Possibility to chart any monitored data for any period (up to 11 variables together).
    - Plotting routines are designed to be flexible.
  - Possibility to export any data in XML format\*.
    - For free with Dashboard server
  - Tier-0 processing statistics\*.
- \* Only available in the development version.

# conTZole Data Collector

- Python scripts computes and saves aggregated values from current Tier-0 state every 5 min
- The script consists of db. queries, system commands and data processing routines
- Hierarchy of classes, heavy use of error blocks
- Very high error resilience.
- Collector is run only in one instance  
**X** there can be multiple servers to access data

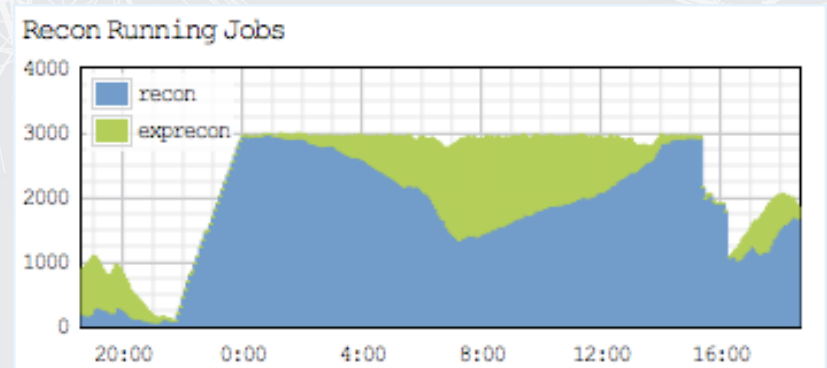


# Current Status

- **Version 0.3** – production quality
- **Deployment**
  - ATLAS Tier-0 production
  - ATLAS CAF
- **Compatibility**
  - Tested to run without issues on Firefox, Safari (including iPhone), Opera, Internet Explorer.
- **Distribution**
  - Dashboard RPM, ATLAS Central Services RPM

# Current Functionality

- Comprehensive Tier-0 monitoring.
- Used in production now.
- Running without outages for more than a year.
- Received positive feedback from the user.
- <https://atlas-tz-monitoring.cern.ch/>





**[atlas-tz-monitoring.cern.ch](https://atlas-tz-monitoring.cern.ch)**  
**Thank you for your attention!**

**Questions?**

**Tomas.Kubes@cern.ch**

***www.TomasKubes.net***