



conTZole

An Interactive ATLAS Tier-0 Monitoring

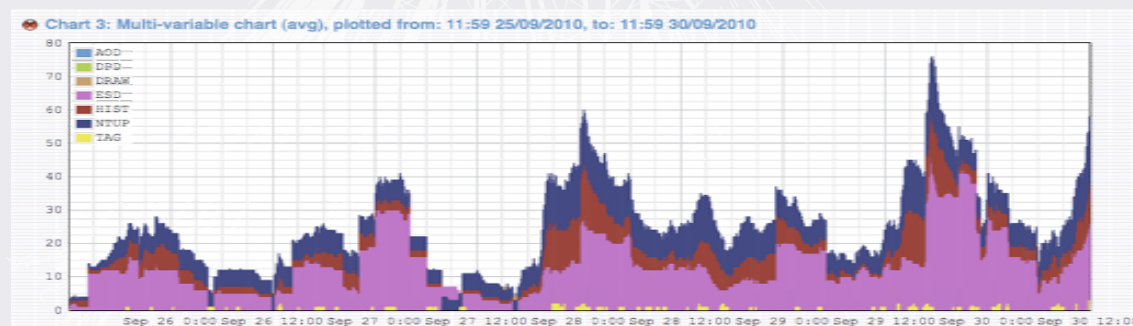
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atlas-tz-monitoring.cern.ch

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**



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

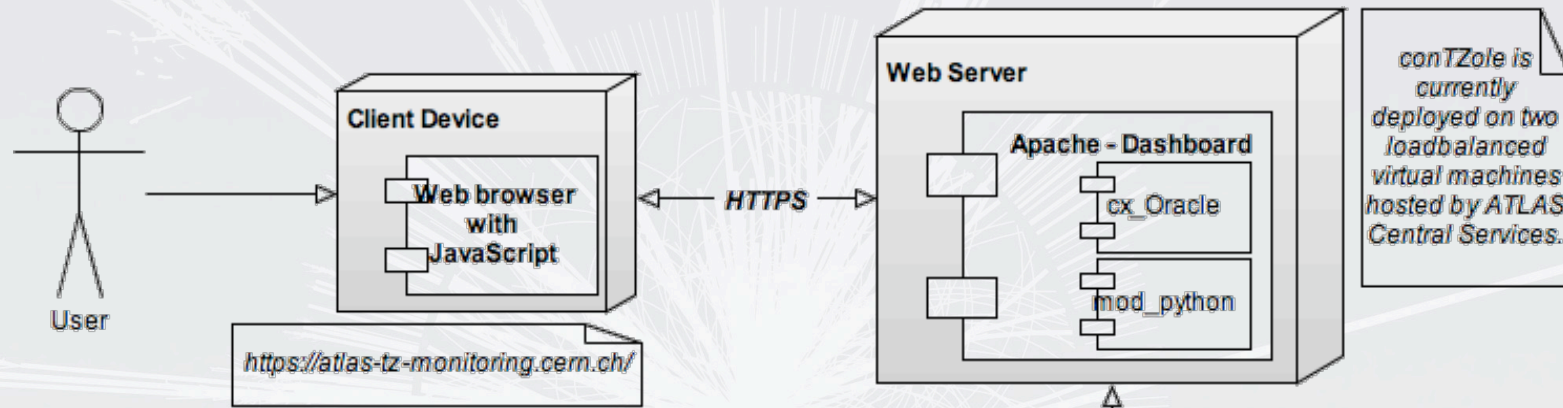
- **Monitor** – Tier-0 processing workflow overview, global view of Tier-0 health
- **Task Lister** – Task and job level view with history, details and operations
- **Dataset Lister** – Dataset view, sorting, history
- **Miscellaneous** – Charts, statistics, data export

back-end

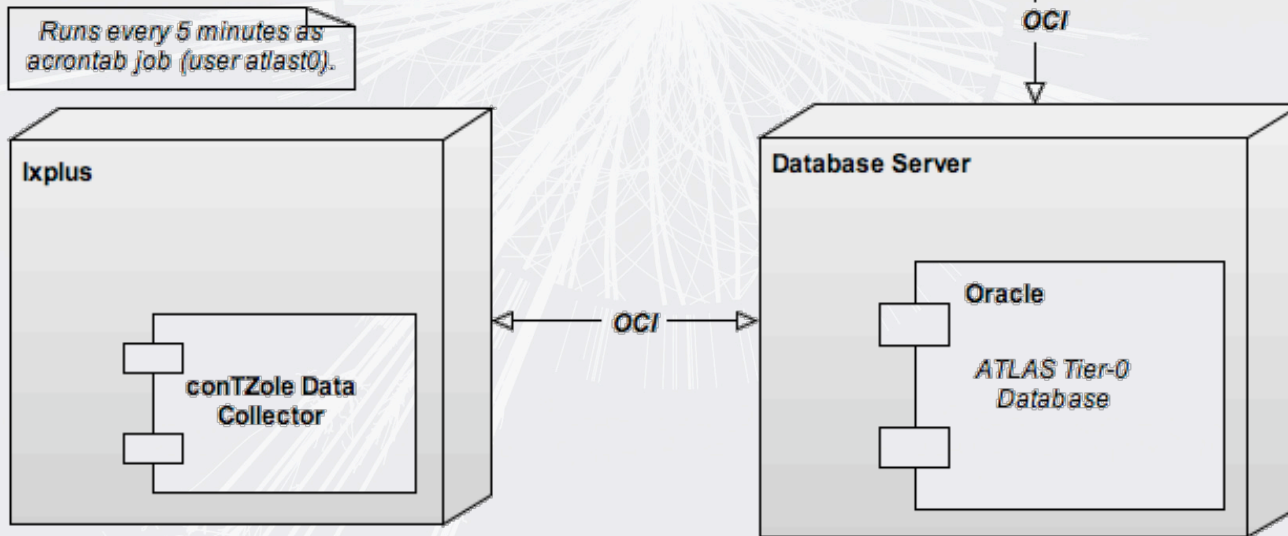
- **Server** – Backend for web components
- **Data Collector** – Saves aggregated snapshots

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)
- Data Collector
 - Python, cx_Oracle



AJAX = Asynchronous JavaScript and XML

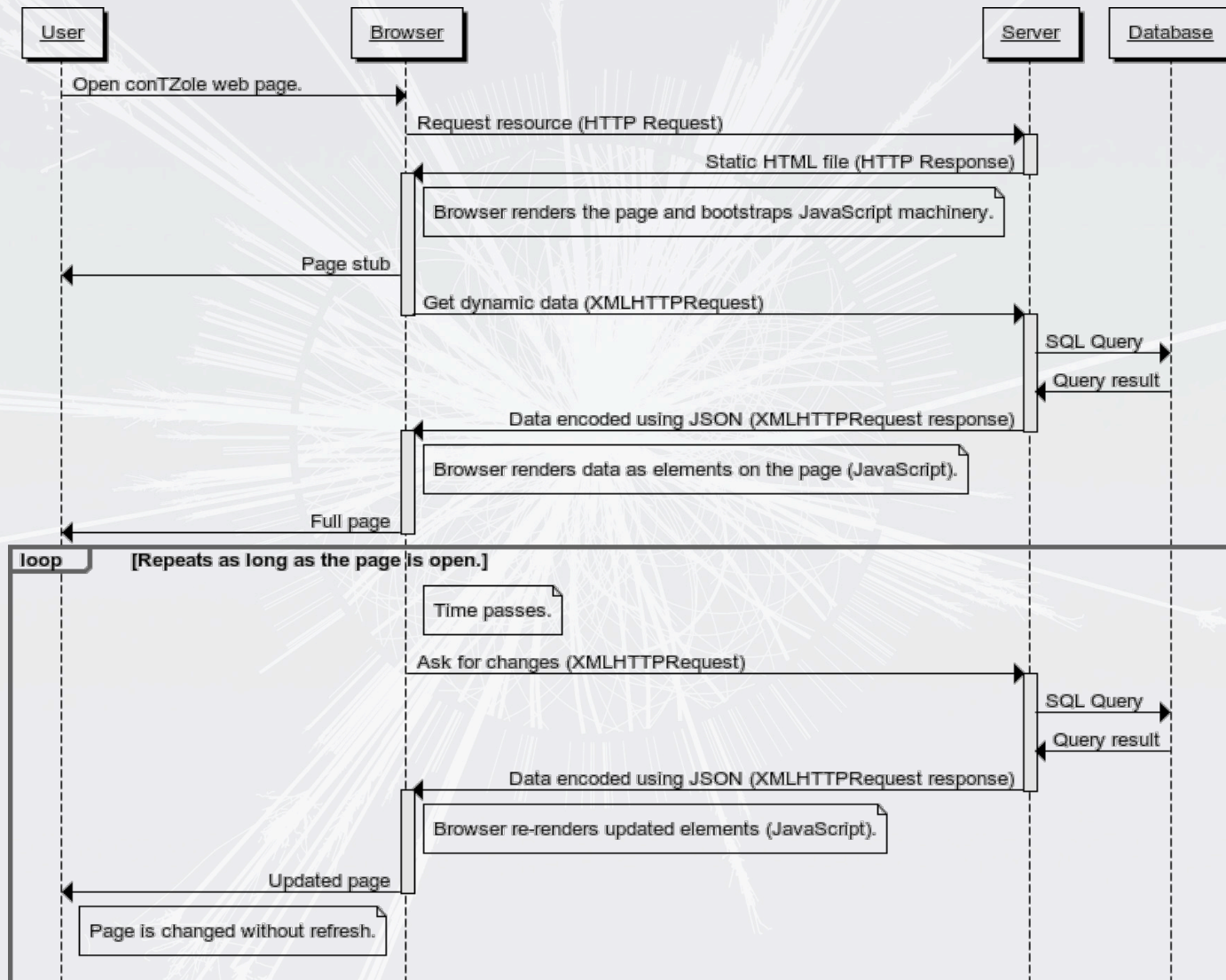


conTZole Web Applications

- 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/>

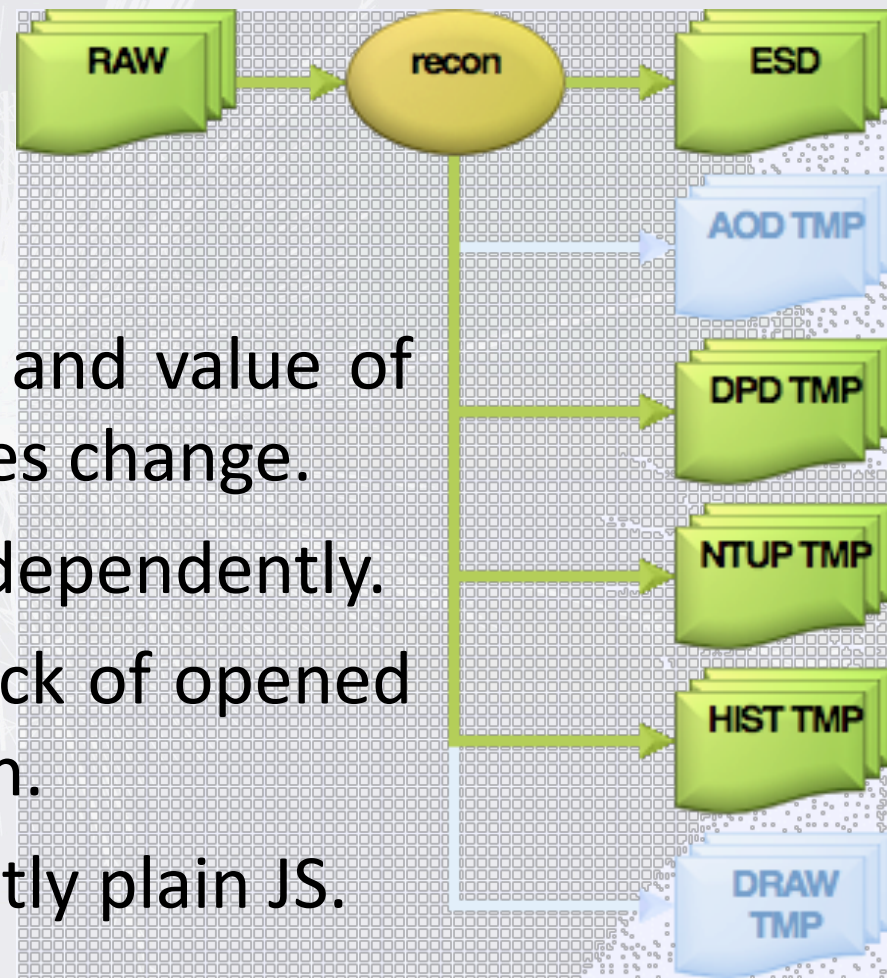
AJAX = Asynchronous JavaScript and XML

conTZole W.A. Sequence Diagram



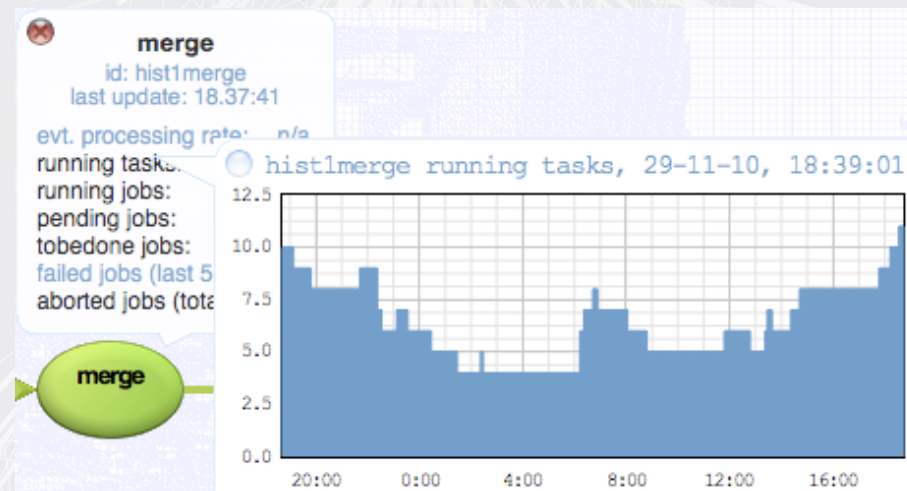
conTZole – Monitor

- Each DOM object has a JS “mirror” object, 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).

Run Num	Task Name	User Name	Task Information	Job Statistics	Time Stamps									
ID	Type	Status	Proc.	rDone	Proc	RTD	Abor	RTF	rErrors	Created	LastModified			
169996	data10.N.00189964.express.express.mergemp.HIST.x86.m860.hist.merge.task...	tzprod	555086	histmerge	RUNNING	0	0	0	0	0	0	28NOV1723	28NOV1724	
169996	data10.N.00189964.express.express.recon.NTUP_THG.x86.m867.ntupmerge.task...	tzprod	555083	ntupmerge	FINISHED	21	12	0	0	0	0	28NOV1714	28NOV1844	
169996	data10.N.00189964.express.express.recon.NTUP_THKVALD.x86.m867.ntupmerge.task...	tzprod	555084	ntupmerge	FINISHED	21	18	0	0	0	0	28NOV1714	28NOV1845	
169996	data10.N.00189964.express.express.recon.NTUP_H.x86.m867.ntupmerge.task...	tzprod	555083	ntupmerge	FINISHED	21	18	0	0	0	0	33NOV1714	28NOV1845	
169996	data10.N.00189964.express.express.recon.ESD.x86.c378.beamspproc.task...	tzprod	555082	beamspproc	FINISHED	3	1	0	0	0	0	28NOV1713	28NOV1836	
169996	data10.N.00189964.express.express.recon.HIST.x86.m866.histmerge.task...	tzprod	555089	histmerge	FINISHED	12	3	0	0	0	0	4536	28NOV1710	28NOV1841
169996	data10.N.00189964.express.express.daq.RAW.x86.recon.task...	tzprod	555074	recon	FINISHED	744	658	29	0	0	0	41380	28NOV1608	28NOV1845
169996	data10.N.00189964.express.express.daq.RAW.rammerge.task...	tzprod	555073	rammerge	FINISHED	124	124	0	0	0	0	48626	28NOV1608	28NOV1731
169996	data10.N.00189964.physics.Background.mergemp.HIST.x86.m866.hist.merge.task...	tzprod	555089	histmerge	RUNNING	0	0	0	0	0	0	0	28NOV1811	28NOV1811
169996	data10.N.00189964.physics.Background.recon.HIST.x86.m866.histmerge.task...	tzprod	555089	histmerge	FINISHED	4	2	0	0	0	0	2261	28NOV1601	28NOV1844
169996	data10.N.00189964.physics.Background.recon.NTUP_THG.x86.m867.ntupmerge.task...	tzprod	555089	ntupmerge	FINISHED	1	0	0	0	0	0	0	28NOV1600	28NOV1843
169996	data10.N.00189964.physics.Background.mergemp.RAW.x86.recon.task...	tzprod	555078	recon	FINISHED	124	33	81	0	0	0	12494	28NOV1622	28NOV1844
169996	data10.N.00189964.physics.Background.daq.RAW.rammerge.task...	tzprod	555075	rammerge	FINISHED	124	124	0	0	0	0	48046	28NOV1612	28NOV1741
169996	data10.N.00189964.physics.CosmicCalo.recon.TAG.x86.m866.lagmerge.task...	tzprod	555082	lagmerge	FINISHED	15	14	0	0	0	0	51227	28NOV1608	28NOV1845
169996	data10.N.00189964.physics.CosmicCalo.mergemp.HIST.x86.m861.histmerge.task...	tzprod	555015	histmerge	RUNNING	0	0	0	0	0	0	0	28NOV0542	28NOV0641
169996	data10.N.00189964.physics.CosmicCalo.recon.HIST.x86.m861.histmerge.task...	tzprod	555010	histmerge	FINISHED	35	30	0	0	0	0	41227	28NOV0629	28NOV1831
169996	data10.N.00189964.physics.CosmicCalo.recon.NTUP_THG.x86.m862.ntupmerge.task...	tzprod	555009	ntupmerge	FINISHED	24	24	0	0	0	0	55247	28NOV0628	28NOV1832
169996	data10.N.00189964.physics.CosmicCalo.mergemp.RAW.x86.recon.task...	tzprod	554999	recon	FINISHED	708	708	0	0	0	0	55247	28NOV0557	28NOV1832
169996	data10.N.00189964.physics.CosmicCalo.daq.RAW.rammerge.task...	tzprod	554987	rammerge	FINISHED	708	708	0	0	0	0	55247	28NOV0552	28NOV1831
169996	data10.N.00189964.physics.CosmicCalo.daq.RAW.rammerge.task...	tzprod	555076	rammerge	FINISHED	124	124	0	0	0	0	41477	28NOV1612	28NOV1741
169996	data10.N.00189964.physics.Stanby.daq.RAW.rammerge.task...	tzprod	549488	rammerge	FINISHED	382	382	0	0	0	0	47443	28NOV0532	28NOV1731
169996	data10.N.00189964.physics.ZenB.recon.TAG.x86.m863.lagmerge.task...	tzprod	555083	lagmerge	FINISHED	3	2	0	0	0	0	6030	28NOV1624	28NOV1844
169996	data10.N.00189964.physics.ZenB.mergemp.HIST.x86.m866.histmerge.task...	tzprod	555082	histmerge	RUNNING	0	0	0	0	0	0	0	28NOV1745	28NOV1745
169996	data10.N.00189964.physics.ZenB.recon.HIST.x86.m866.histmerge.task...	tzprod	555081	histmerge	FINISHED	6	5	1	0	0	0	5336	28NOV1608	28NOV1835
169996	data10.N.00189964.physics.ZenB.daq.RAW.x86.recon.task...	tzprod	555079	recon	FINISHED	124	124	0	0	0	0	10572	28NOV1628	28NOV1832
169996	data10.N.00189964.physics.ZenB.daq.RAW.rammerge.task...	tzprod	555077	rammerge	FINISHED	124	124	0	0	0	0	10572	28NOV1612	28NOV1741
169996	data10.N.00189964.physics.CosmicCalo.mergemp.TAG.x86.m863.lagmerge.task...	tzprod	555011	lagmerge	FINISHED	1	1	0	0	0	0	82	28NOV0631	28NOV0829
169996	data10.N.00189964.physics.CosmicCalo.mergemp.HIST.x86.m861.histmerge.task...	tzprod	555008	histmerge	FINISHED	1	1	0	0	0	0	82	28NOV0621	28NOV0829
169996	data10.N.00189964.physics.CosmicCalo.recon.TAG.x86.m863.lagmerge.task...	tzprod	555007	lagmerge	FINISHED	1	1	0	0	0	0	82	28NOV0621	28NOV0829
169996	data10.N.00189964.physics.CosmicCalo.recon.HIST.x86.m861.histmerge.task...	tzprod	555003	histmerge	FINISHED	2	2	0	0	0	0	82	28NOV0628	28NOV0829
169996	data10.N.00189964.physics.CosmicCalo.recon.NTUP_THG.x86.m862.ntupmerge.task...	tzprod	555002	ntupmerge	FINISHED	1	1	0	0	0	0	82	28NOV0605	28NOV0829
169996	data10.N.00189964.physics.CosmicCalo.daq.RAW.x86.recon.task...	tzprod	549493	recon	FINISHED	2	2	0	0	0	0	82	28NOV0430	28NOV0819
169996	data10.N.00189964.physics.CosmicCalo.daq.RAW.rammerge.task...	tzprod	549491	rammerge	FINISHED	2	2	0	0	0	0	82	28NOV0424	28NOV0827
169996	data10.N.00189964.physics.Stanby.daq.RAW.rammerge.task...	tzprod	549492	rammerge	FINISHED	2	2	0	0	0	0	76	28NOV0424	28NOV0827
169996	data10.N.00189964.express.express.mergemp.HIST.x86.m866.histmerge.task...	tzprod	555036	lagmerge	FINISHED	1	1	0	0	0	0	49828	28NOV0814	28NOV0825
169996	data10.N.00189964.express.express.recon.DESDM_HIRARE.x86.m865.dpdmerge.task...	tzprod	555031	dpdmerge	FINISHED	5	5	0	0	0	0	1101	28NOV0752	28NOV0852
169996	data10.N.00189964.express.express.recon.TAG.x86.m863.lagmerge.task...	tzprod	555026	lagmerge	FINISHED	12	12	0	0	0	0	49828	28NOV0751	28NOV0811
169996	data10.N.00189964.express.express.mergemp.HIST.x86.m861.histmerge.task...	tzprod	549489	histmerge	FINISHED	1	1	0	0	0	0	49828	28NOV0552	28NOV0853
169996	data10.N.00189964.express.express.recon.ESD.x86.c378.beamspproc.task...	tzprod	549488	beamspproc	FINISHED	11	11	0	0	0	0	0	28NOV0348	28NOV0851
169996	data10.N.00189964.express.express.recon.NTUP_THG.x86.m862.ntupmerge.task...	tzprod	549487	ntupmerge	FINISHED	20	20	0	0	0	0	49828	28NOV0347	28NOV0851
169996	data10.N.00189964.express.express.recon.NTUP_THKVALD.x86.m867.ntupmerge.task...	tzprod	549486	ntupmerge	FINISHED	20	20	0	0	0	0	49828	28NOV0347	28NOV0851
169996	data10.N.00189964.express.express.recon.HIST.x86.m861.histmerge.task...	tzprod	549485	histmerge	FINISHED	23	23	0	0	0	0	49828	28NOV0347	28NOV0851
169996	data10.N.00189964.express.express.daq.RAW.x86.recon.task...	tzprod	549478	recon	FINISHED	578	578	1	0	0	0	49828	28NOV0323	28NOV0751
169996	data10.N.00189964.express.express.daq.RAW.rammerge.task...	tzprod	549474	rammerge	FINISHED	96	96	0	0	0	0	49828	28NOV0322	28NOV0751
169996	data10.N.00189964.express.express.mergemp.HIST.x86.m861.histmerge.task...	tzprod	555004	histmerge	RUNNING	0	0	0	0	0	0	0	28NOV0811	28NOV0811
169996	data10.N.00189964.physics.Background.recon.HIST.x86.m861.histmerge.task...	tzprod	555000	histmerge	FINISHED	15	15	0	0	0	0	4603	28NOV0557	28NOV1838
169996	data10.N.00189964.physics.Background.recon.NTUP_THG.x86.m862.ntupmerge.task...	tzprod	549498	ntupmerge	FINISHED	3	3	0	0	0	0	35516	28NOV0548	28NOV1811
169996	data10.N.00189964.physics.Background.mergemp.RAW.x86.recon.task...	tzprod	549489	recon	FINISHED	101	99	2	0	0	0	4603	28NOV0332	28NOV1427
169996	data10.N.00189964.physics.Background.daq.RAW.rammerge.task...	tzprod	549475	rammerge	FINISHED	101	101	0	0	0	0	4603	28NOV0332	28NOV1427
169996	data10.N.00189964.physics.CosmicCalo.mergemp.TAG.x86.m863.lagmerge.task...	tzprod	555013	lagmerge	FINISHED	1	1	0	0	0	0	1613	28NOV0640	28NOV0650
169996	data10.N.00189964.physics.CosmicCalo.recon.TAG.x86.m863.lagmerge.task...	tzprod	555008	lagmerge	FINISHED	5	5	0	0	0	0	1613	28NOV0621	28NOV0839
169996	data10.N.00189964.physics.CosmicCalo.mergemp.HIST.x86.m861.histmerge.task...	tzprod	549485	histmerge	FINISHED	1	1	0	0	0	0	1613	28NOV0619	28NOV0839
169996	data10.N.00189964.physics.CosmicCalo.recon.NTUP_THG.x86.m862.ntupmerge.task...	tzprod	549482	ntupmerge	FINISHED	8	8	0	0	0	0	1613	28NOV0614	28NOV0839
169996	data10.N.00189964.physics.CosmicCalo.recon.HIST.x86.m861.histmerge.task...	tzprod	549481	histmerge	FINISHED	21	21	0	0	0	0	1613	28NOV0604	28NOV0751

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

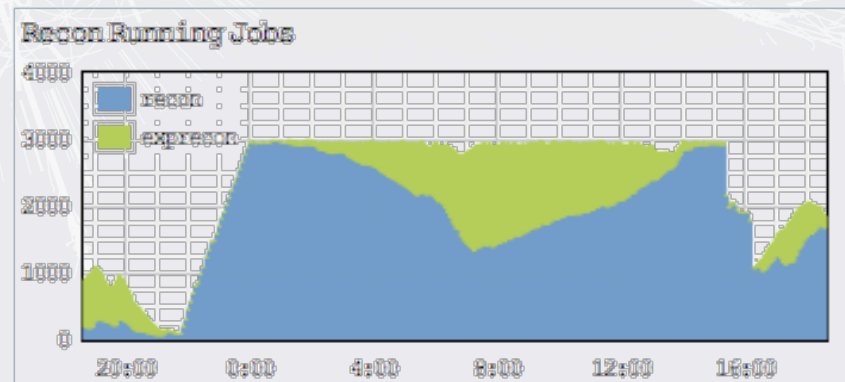
- Python scripts computes and saves aggregated values from current Tier-0 state every 5 min
- The script consists of db. queries, system commands and data processing routines
- Hierarchy of classes, heavy use of error blocks
- Very high error resilience.
- Collector is run only in one instance
X there 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
Thank you for your attention!

Questions?

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