CDF Initiative Monitor Initial Deployment List

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Introduction

The goal of this document is to provide a preliminary estimate of the number of checks and amount of data that is required to be stored in the Zabbix monitoring system database for CDF CAF Operations. The deployment of Zabbix is planned to be a phased deployment and it is anticipated that additional checks will likely come to light as experience is gained with operations during each phase. The idea is to phase in one or two types of monitoring categories at a time. The estimates in here are provided so that a general feeling for requirements of the system can be determined in terms of database size.

Mapping of Hosts to Types

Various hosts exhibit patterns in the kinds of checks that are needed. These patterns are called types in this document and map well into in the concept of a Zabbix template. Machines that from a given system, like the Fermigrid system, may perform significantly different functions and thus map into different templates. However in a monitoring environment one might want to view them together. This could be accomplished using the Zabbix concept of groups.

Type	Host(s)	System
Monitor	fcdfmon5	Monitor
GCB Server	fcdfsrv102, fcdfsrv103, fcdfsrv104	GCB
ICAF Machine	fcdfhead1	ICAF
Groupcaf Head	fcdfhead3	Groupcaf
Groupcaf WN	496 nodes	Groupcaf
Collector Negotiator	fcdfhead4 (-> fcdfhead11)	Fermigrid
Schedd	fcdfhead2 (-> fcdfhead10)	Fermigrid
Collector Negotiator	fcdfhead5	Namcaf
Schedd	fcdfhead6	Namcaf
ICAF servers	?	ICAF

Formulas for Estimating Data Retention Size

There are four different classes of data to store in the database for a Zabbix installation: configuration; history; trend; and event. The formulas used here are derived from the Zabbix User's Guide. Configuration data represents the overhead of managing Zabbix itself. For Configuration data, the estimate is a roughly fixed 10 MB. History data represents storage of the actual measurements being made and associated overhead. For history data, the calculation in bytes per day can be calculated as follows

$$HistData = History * (h/d) * (s/h) * Freq * (Count) * (bytes/item)$$

or

$$HistData = (s * bytes/day/item) * Freq * Count$$

Trend data represents an averaging of the history data done with a period of 30 minutes. For trend data replace the 50 bytes by 128 bytes and Frequency by 1/(1800 s) (every 30 minutes)

$$TrendData = (s * bytes/day/item) * Count$$

For calculating Event data, we can assume that there are a limited number of triggers and that where appropriate hysteresis is used to prevent oscillating around the trigger threshold. Then it is probably reasonable to assume events happen at a rate less than once per minute. In the Zabbix User's manual there is a calculation for an event once per second, but that seems extremely unlikely in this case.

$$EventData = (bytes/event * events/day) = . MBytes/day$$

Note that the trend data period is 30 minutes, not much longer than the default period chosen in this document for data collecting. Given the increased size per item stored for trend data and that it doesn't provide any real benefit over the history data given the periods, trend data does not provide any additional value. Therefore, unless check periods significantly decrease it is advantageous to keep the trend data save period short.

Monitor				
Item	**Type**	**Count**	**Period "1/freq" (s)**	**Daily Data (MB/day)**
Mount /home/cdfsoft	Int	1	1200	0.003
Mount /home/cdfcaf	Int	1	1200	0.003
Apache server running (exists)	Int	1	1200	0.003
CPU % updateStatus.py	Float	1	1200	0.003
Memory updateStatus.py	Int	1	1200	0.003
Process count updateStatus.py	Int	1	1200	0.003
CPU % updateComplete.py	Float	1	1200	0.003
Memory updateComplete.py	Float	1	1200	0.003
Process count updateComplete.py	Int	1	1200	0.003
Data collection cache timestamp	Str	1	1200	0.003
rrd tool timestamp	Str	1	1200	0.003
History Total		11		0.038
Trend Total		11		0.064

GCB Servers				
Item	**Type**	**Count**	**Period "1/freq" (s)**	**Daily Data (MB/day)**
Mount /home/cdfcaf	Int	3	1200	0.010
Process count gcb_relay_server	Int	3	1200	0.010
Process count condor_master	Int	3	1200	0.010
History Total		9		0.031
Trend Total		9		0.053

ICAF Machine				
Item	**Type**	**Count**	**Period "1/freq" (s)**	**Daily Data (MB/day)**
Mount /home/cdfsoft	Int	1	1200	0.003
Mount /home/cdfcaf	Int	1	1200	0.003
Status icaf.py	Int	1	1200	0.003
History Total		3		0.010
Trend Total		3		0.018

Groupcaf Head				
Item	**Type**	**Count**	**Period "1/freq" (s)**	**Daily Data (MB/day)**
Mount /home/cdfsoft	Int	1	1200	0.003
Mount /home/cdfcaf	Int	1	1200	0.003
Apache server running (exists)	Int	1	1200	0.003
Cron log tickets refresh time	Str	1	1200	0.003
Cron logf tickets refresh	Int	1	1200	0.003
Cron log check synchonization time	Str	1	1200	0.003
Cron logf check synchonization	Int	1	1200	0.003
CPU % condor_collector	Float	1	1200	0.003
Memory condor_collector	Float	1	1200	0.003
Health condor_collector	Int	1	1200	0.003
CPU % condor_negotiator	Float	1	1200	0.003
Memory condor_negotiator	Float	1	1200	0.003
Health condor negotiator	Int	1	1200	0.003
CPU % condor_schedd	Float	4	1200	0.014
Memory condor_schedd	Float	4	1200	0.014
Health condor schedd	Int	4	1200	0.014
Schedd EXIT status dump	Str	1	1200	0.003
Schedd EXIT Success	Int	4	1200	0.014
Schedd EXIT Error	Int	4	1200	0.014
Schedd Total Running Jobs	Int	4	1200	0.014
Schedd total held jobs	Int	4	1200	0.014
Schedd total owner jobs	Int	4	1200	0.014
Schedd total claimed jobs	Int	4	1200	0.014
Schedd total unclaimed jobs	Int	4	1200	0.014
CPU % submitter.py	Float	1	1200	0.003
Health submitter.py	Int	1	1200	0.003
CPU % monitor.py	Float	1	1200	0.003
Health monitor.py	Int	1	1200	0.003
CPU % xml_monitor.py	Float	1	1200	0.003
Health xml_monitor.py	Int	1	1200	0.003
CPU % mailer.py	Float	1	1200	0.003
Health mailer.py	Int	1	1200	0.003
CPU % acctgroups.py	Float	1	1200	0.003
Health acctgroups.py	Int	1	1200	0.003
File check mailer.py (size or length)	Int	1	1200	0.003
Free space % (data folder)	Float	1	1200	0.003
Free space % /stage	Float	1	1200	0.003
History Total		67		0.230
Trend Total		67		0.393

Groupcaf WN				
Item	**Type**	**Count**	**Period "1/freq" (s)**	**Daily Data (MB/day)**
Mount /home/cdfsoft	Int	496	1200	1.703
Mount /home/cdfcaf	Int	496	1200	1.703
Lowest free space %	Float	496	1200	1.703
Free space % N disks	Str	496	1200	1.703
History Total		1984		6.812
Trend Total		1984		11.625

Collector Negotiator				
Item	**Type**	**Count**	**Period "1/freq" (s)**	**Daily Data (MB/day)**
Mount /home/cdfsoft	Int	2	1200	0.007
Mount /home/cdfcaf	Int	2	1200	0.007
CPU % collector	Float	2	1200	0.007
Memory collector	Float	2	1200	0.007
Log check collector	Str	2	1200	0.007
CPU % negotiator	Float	2	1200	0.007
Memory negotiator	Float	2	1200	0.007
Log check negotiator	Str	2	1200	0.007
Cron log tickets refresh time	Str	2	1200	0.007
Cron logf tickets refresh	Int	2	1200	0.007
Cron log check synchonization time	Str	2	1200	0.007
Cron log check synchonization	Int	2	1200	0.007
History Total		24		0.082
Trend Total		24		0.141

Schedd				
Item	**Type**	**Count**	**Period "1/freq" (s)**	**Daily Data (MB/day)**
Mount /home/cdfsoft	Int	2	1200	0.007
Mount /home/cdfcaf	Int	2	1200	0.007
Apache server running (exists)	Int	2	1200	0.007
Cron log tickets refresh time	Str	2	1200	0.007
Cron logf tickets refresh	Int	2	1200	0.007
Cron log check synchonization time	Str	2	1200	0.007
Cron logf check synchonization	Int	2	1200	0.007
CPU % condor_schedd	Float	22	1200	0.076
Memory condor_schedd	Float	22	1200	0.076
Health condor schedd	Int	2	1200	0.007
Schedd EXIT status dump	Str	2	1200	0.007
Schedd EXIT Success	Int	22	1200	0.076
Schedd EXIT Error	Int	22	1200	0.076
Schedd Total Running Jobs	Int	22	1200	0.076
Schedd total held jobs	Int	22	1200	0.076
Schedd total owner jobs	Int	22	1200	0.076
Schedd total claimed jobs	Int	22	1200	0.076
Schedd total unclaimed jobs	Int	22	1200	0.076
Glideins send	Int	2	1200	0.007
Glideins match	Int	2	1200	0.007
CPU % submitter.py	Float	2	1200	0.007
Health submitter.py	Int	2	1200	0.007
CPU % monitor.py	Float	2	1200	0.007
Health monitor.py	Int	2	1200	0.007
CPU % xml_monitor.py	Float	2	1200	0.007
Health xml_monitor.py	Int	2	1200	0.007
Load mailer.py	Int	2	1200	0.007
Health mailer.py	Int	2	1200	0.007
CPU % acctgroups.py	Float	2	1200	0.007
Health acctgroups.py	Int	2	1200	0.007
File check mailer.py (size or length)	Int	2	1200	0.007
Health glidekeeper.py	Int	2	1200	0.007
Glidein run time (don't come back)	Int	2	1200	0.007
Glidein run time (died)	Int	2	1200	0.007
Analyze validate_nodes	Int	2	1200	0.007
Free space % (data folder)	Float	2	1200	0.007
Free space % /stage	Float	2	1200	0.007
VOMS server check	Int	1	1200	0.003
History Total		255		0.875
Trend Total		255		1.494

Note: We should try to come up with a count of the servers and some minimal level of checks, which could be 0 for the first round.

ICAF Servers ???				
Item	**Type**	**Count**	**Period "1/freq" (s)**	**Daily Data (MB/day)**
History Total				
Trend Total				

Total History Data Estimate				
Template	**Items**	**Daily Data (MB/day)**	**Retention (days)**	**Total (MB)**
Monitor	11	0.038	365	13.870
GCB Servers	9	0.031	365	11.315
ICAF Machine	3	0.010	365	3.650
Groupcaf Head	67	0.230	365	83.950
Groupcaf WN	1984	6.812	365	2486.380
Collector Negotiator	24	0.082	365	29.930
Schedd	255	0.875	365	319.375
ICAF Servers	0	0.000	365	0.000
Total	2353	8.078		2948.470

Because the current estimate for the sampling period is 20 minutes, which is close to the 30 minute period for trend data, there is not any real value in keeping trend data around compared to history data. Also since in this configuration the trend data takes up more space than the history data, it is best to keep the history data longer and not retain the trend data. A small nonzero trend data retention period is assumed to avoid any issues with setting the value to zero in the system. This will incur a negligible storage requirement.

Total Trend Data Estimate				
Template	**Items**	**Daily Data (MB/day)**	**Retention (days)**	**Total (MB)**
Monitor	11	0.064	1	0.064
GCB Servers	9	0.053	1	0.053
ICAF Machine	3	0.018	1	0.018
Groupcaf Head	67	0.393	1	0.393
Groupcaf WN	1984	11.625	1	11.625
Collector Negotiator	24	0.141	1	0.141
Schedd	255	1.494	1	1.494
ICAF Servers	0	0.000	1	0.000
Total	2353	13.788		13.788

Total Event Data Estimate			
	Daily Data (MB/day)	**Retention (days)**	**Total (MB)**
Event Data	0.178	365	64.970

Putting all of these estimates together yields a total disk space requirement for the monitoring system data. It should be noted that monitoring of the Groupcaf WN is under consideration and may not be included in the final system. Therefore the total estimate will be given for both including and excluding the Groupcaf WN monitoring.

Type	**W/ Groupcaf WN (MB)**	**W/O Groupcaf WN (MB)**
Configuration	10.000	10.000
History	2948.470	462.090
Trend	13.788	2.163
Event	64.970	64.970
Total (GB)	2.97	0.53

To be on the safe side since we expect that over time some additional checks will be added as we gain familiarity with operations, we can scale the totals by a factor of 2 which should be more than adequate. Thus the estimate ranges from about 1 GB without Groupcaf WN to 6GB with Groupcaf WN.

List of Groupcaf Worker Nodes

fcdfcaf326 fcdfcaf328 fcdfcaf329 fcdfcaf330 fcdfcaf332 fcdfcaf337 fcdfcaf338
fcdfcaf343 fcdfcaf345 fcdfcaf346 fcdfcaf347 fcdfcaf348 fcdfcaf349 fcdfcaf353
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