IBM Elastic Storage Server (ESS) Monitoring Agent

Y. Frank Jou
IBM
yfrankjou@ibm.com
Version 8.1.4

Description:

IBM Elastic Storage Server (ESS) is a modern implementation of software-defined storage, combining IBM Spectrum Scale software with IBM POWER8® processor-based I/O-intensive servers and dual-ported storage enclosures. This package includes a monitoring agent to monitor IBM ESS. It was developed and tested with ESS versions 5.0.4 and 6.0.0, but the agent should work with other versions of ESS.

The agent runs shell scripts with curl queries to pull performance data from the ESS management node. The agent provides detailed statistics of ESS performance at node, pool, and disk levels. It also monitors NFS and SMB operations where applicable.

This solution is unsupported. However, if you need assistance, send an email to Frank Jou at yfrankjou@ibm.com.

Prerequisites:

1) This agent requires IBM Cloud Application Performance Management version 8.1.4 or higher
2) This agent was tested with IBM ESS v5.0.4 and v6.0.0, but should work with other versions
3) Prior to install the IBM ESS monitoring Agent, you must install another APM v8 monitoring agent. For example, you can install the Operating System Agent for Linux.
4) Given the shell scripts were developed on a Linux server, the ESS monitoring agent is designed to run on a 64-bit Linux platform.

Installation and Configuration Instructions:

Run the following steps to install, configure, and start the ESS monitoring agent:

1) Installation:
   a) Copy the agent tar file (smai-ess-01.00.00.00.tgz) to the directory of choice
   b) Extract the contents of the tar file by running "`tar xvf smai-ess-01.00.00.00.tgz`"
   c) From within the extracted files, run "`./installIraAgent.sh <APM agent installation home directory>`"
      i) Example: "`./installIraAgent.sh /opt/ibm/apm/agent/`" to install the agent to the target directory
2) Configuration:
   a) Change directory to `<APM agent installation home directory>/bin`
      i) Example: "`cd /opt/ibm/apm/agent/bin`"

b) You will configure one or more agent instance. Each Agent instance will monitor an ESS storage cluster. Configure the first agent instance by typing: `./ess-agent.sh config <instance name>`
   Example: `./ess-agent.sh config ESS1`
   i) Edit 'Monitoring Agent for ESS' settings? [1=Yes, 2=No] (default is: 1): enter 1 or simply hit enter key
   ii) The host where the ESS Server is running. HostName (default is): provide the hostname or IP address where ESS management node is running
   iii) Network Port where ESS exposes via REST APIs. ESS Port (default is: 443): provide the network port where ESS exposes via REST APIs

c) If you have more than one ESS cluster, you can configure additional agent instances. For example, configure the subsequent agent instance by typing: `./ess-agent.sh config <instance name>`
   Example: `./ess-agent.sh config ESS2`
   i) Edit 'Monitoring Agent for ESS' settings? [1=Yes, 2=No] (default is: 1): enter 1 or simply hit enter key
   ii) The host where the ESS Server is running. HostName (default is): provide the hostname or IP address where ESS management node is running
   iii) Network Port where ESS exposes via REST APIs. ESS Port (default is: 443): provide the network port where ESS exposes via REST APIs

3) Start the agent instances by typing: `./ess-agent.sh start <instance name>`
   Example: `./ess-agent.sh start ESS1`
4) When you need to stop the agent, type: `./ess-agent.sh stop <instance name>`
   Example: `./ess-agent.sh stop ESS1`

After some time, the ESS agent should show up on the APM UI (see screenshot below). At the top level, the agent displays its instance name (ESS1 or ESS2), where the agent was installed (sapm-apm3), and its agent code (EH). It shows the ESS hostname and network port that the monitoring scripts are connected to. It also displays both the CPU and memory usage level across all nodes within the ESS system.

When you click anywhere on the top level graph, you are directed to the next level of monitoring statistics as shown in the sample tables below. These tables include CPU Utilization, Network Bandwidth, Pool Capacity, Pool Workload, NSD Response Time, NFS Operations, SMB Operations, Disk Capacity, and Disk Workload.

These tables present real time data updated at a one-minute interval. If you are concerned that 1 minute data collections against the ESS storage cluster will drive too much work against the ESS management node, you can change the collection interval using the steps below. If you want to change this refresh interval from the default one-minute to other interval (say 3-minute), then update the configuration file in `< APM agent installation home directory >/config/eh.environment` (e.g.,

`/opt/ibm/apm/agent/config/eh.environment`) by adding the following parameters:

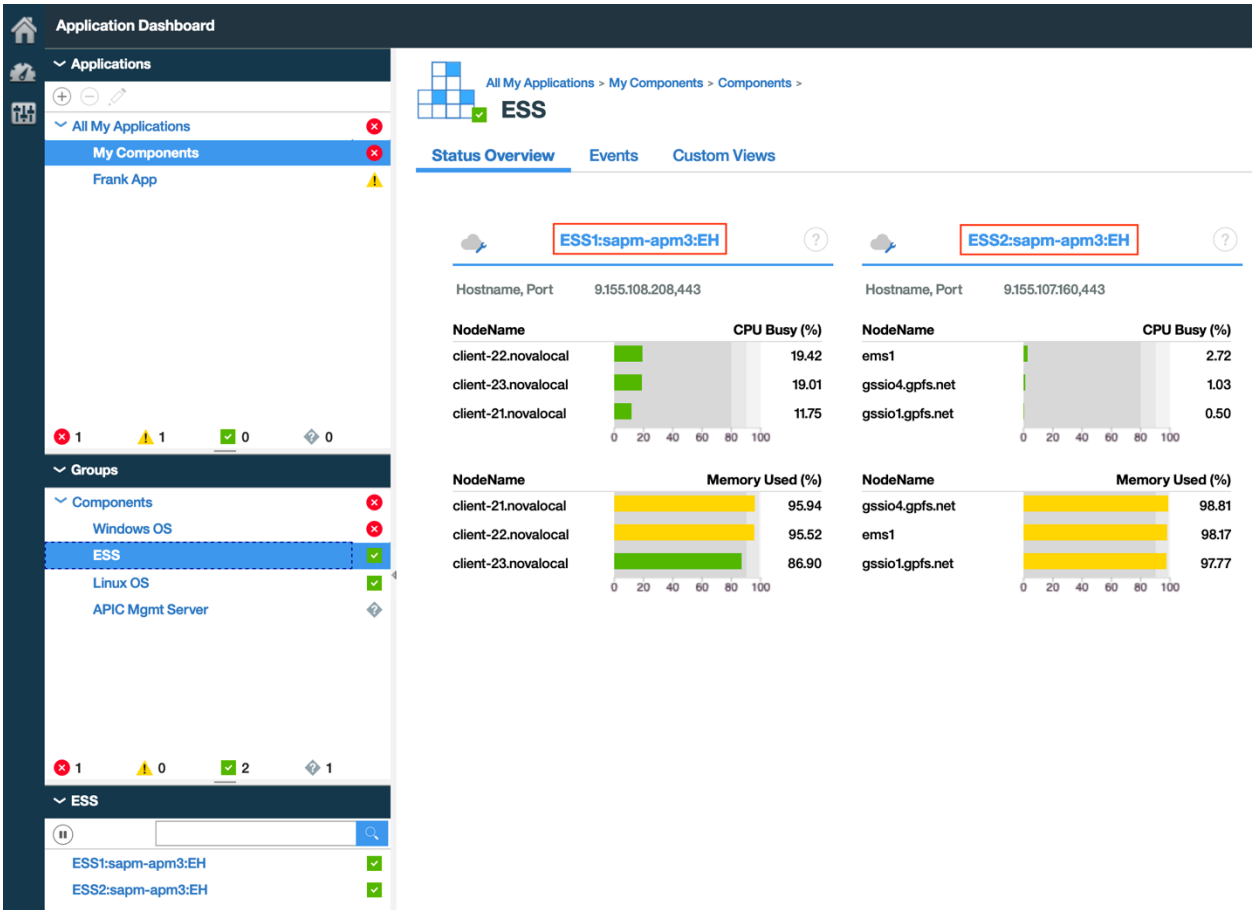
```
CDP_DP_REFRESH_INTERVAL=180
CDP_DP_CACHE_TTL=175
```

The CDP_DP_REFRESH_INTERNAL is the number of seconds use to gather the data. Specifying 180 means that the Agent will gather data every 180 seconds.

The CDP_DP_CACHE_TTL represents the time to live for the metric data. You always want the TTL to be a slightly smaller interval than the refresh interval.

Restart the agent for the new configuration to be effective.

Note: The APM user interval only shows historical data at one minute intervals, so do not set `CDP_DP_REFRESH_INTERVAL` to less than 60 seconds and set it to increments of 60 seconds.



ESS1:sapm-apm3:EH

Integrate with OA-LA to enable

CPU Utilization

NodeName	Load	CPU Busy Pcnt	CPU System	CPU User
client-22.nova…	0.42	22.138	14.75833	6.89750
client-21.noval…	0.17	18.509	13.19467	4.71417
client-23.nova…	0.36	14.157	9.44383	3.84750

Network Bandwidth

NodeName	NICName	NwkBytesRecvd	NwkBytesSent
client-21.novalocal	eth0	1160548	556389
client-21.novalocal	lo	665804	665804
client-22.novalocal	eth0	661509	1060122
client-22.novalocal	lo	551706	551706
client-23.novalocal	eth0	222759	422197
client-23.novalocal	lo	61712	61712
client-21.novalocal	eth1	0	0
client-22.novalocal	eth1	0	0
client-23.novalocal	eth1	0	0

Pool Capacity

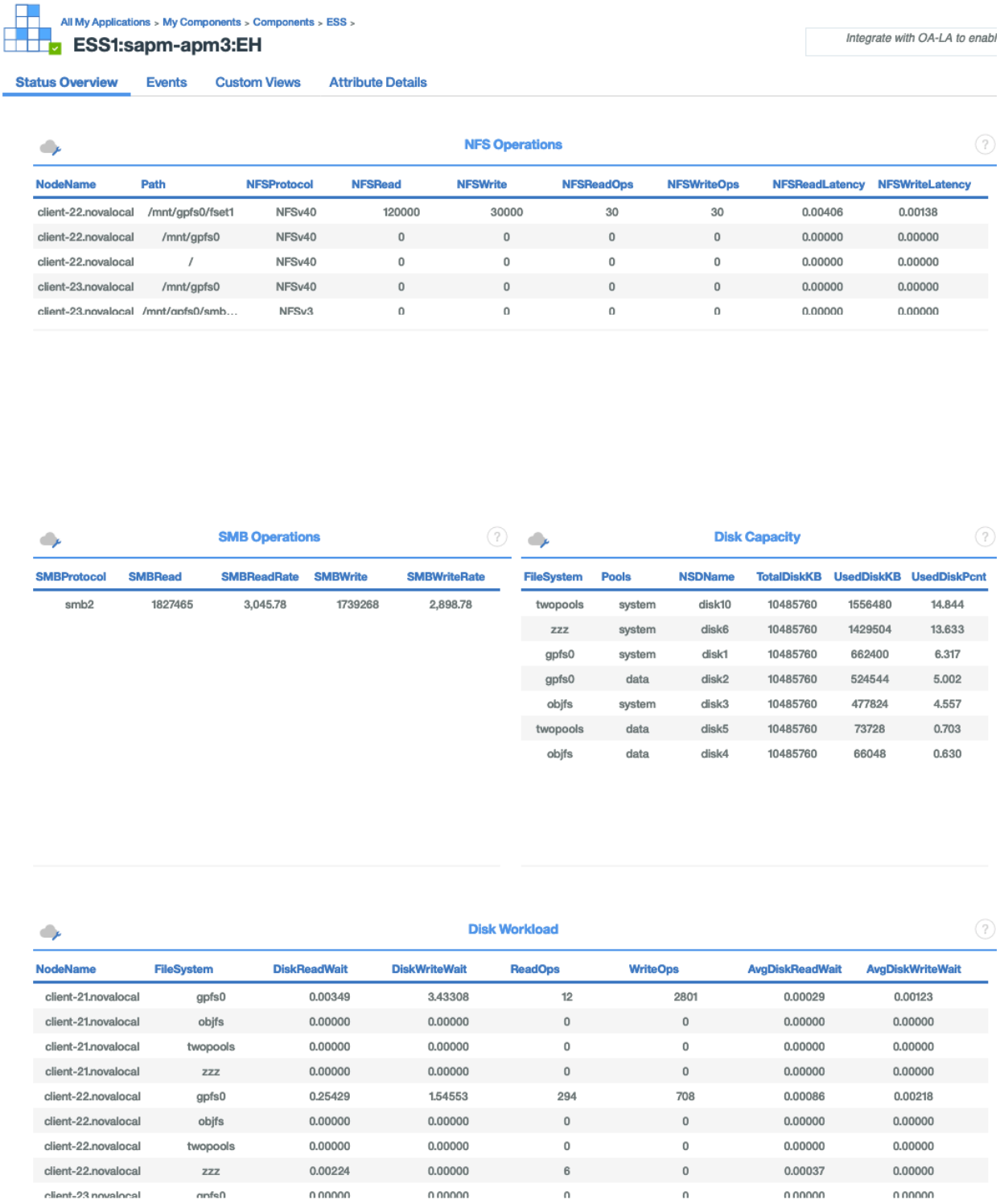
PoolName	FileSystem	TotalPoolKB	UsedPoolKB	UsedPoolPcnt
system	twopools	10485760	1556480	14.844
system	zzz	10485760	1429504	13.633
data	gpfs0	10485760	524544	5.002
data	twopools	10485760	73728	0.703
data	objfs	10485760	66048	0.630
system	gpfs0	0	0	0.000
system	objfs	0	0	0.000

Pool Workload

NodeName	FileSystem	PoolName	PoolBytesRead	PoolBytesWrite
client-21.noval…	gpfs0	data	122880	0
client-21.noval…	twopools	data	11264	0
client-22.nova…	twopools	system	11264	0
client-21.noval…	gpfs0	system	0	294912
client-21.noval…	objfs	data	0	0
client-21.noval…	objfs	system	0	0
client-22.nova…	free_disk	พยัญชนะ	0	0
client-22.nova…	free_disk	system	0	0
client-22.nova…	zzz	system	0	0

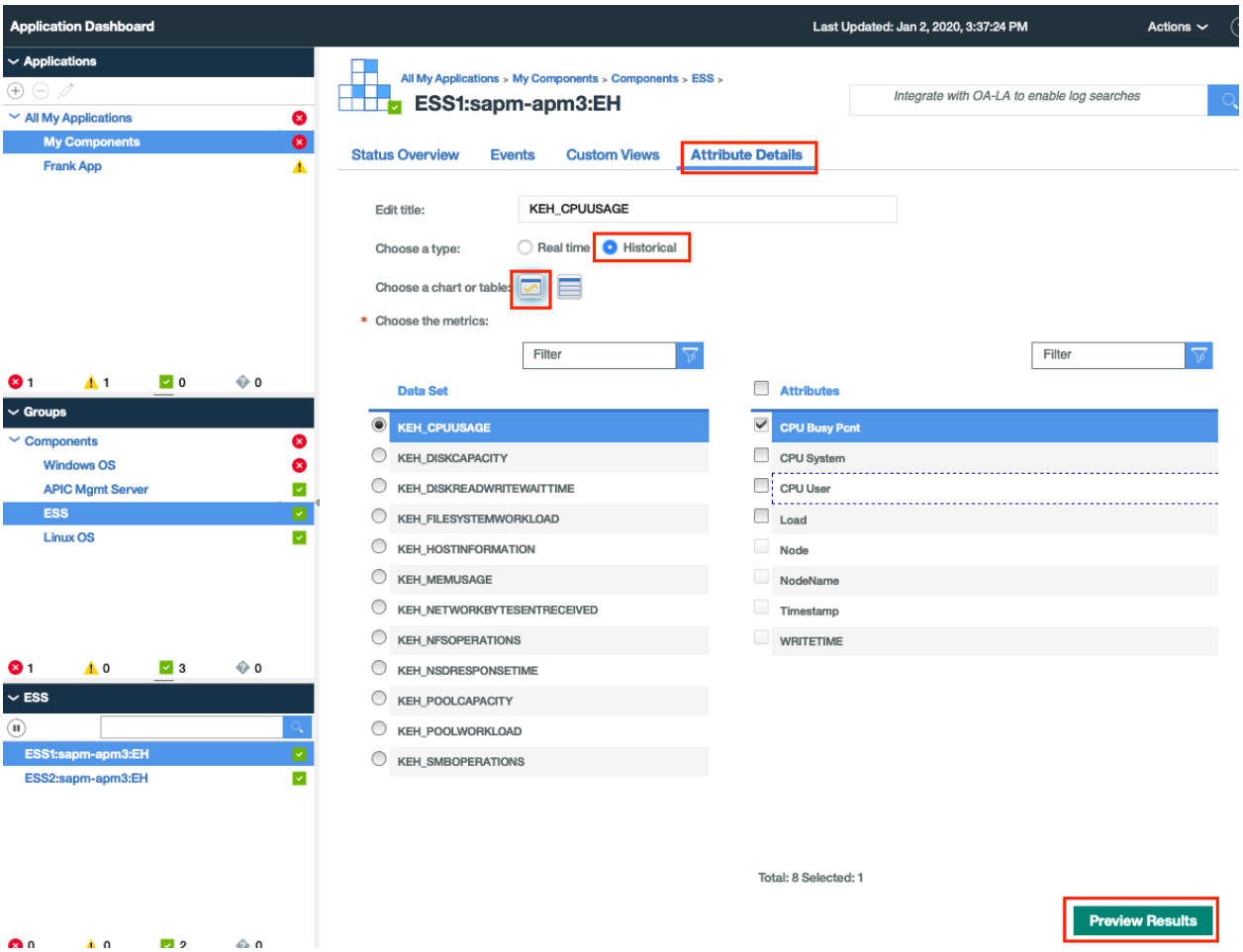
NSD Response Time

NodeName	NSDName	NSDReadWait	NSDWriteWait	NSDReadOps	NSDWriteOps	NSDReadResponse	NSDWriteResponse
client-21.novalocal	disk1	0.00000	0.11929	0	72	0.00000	0.00166
client-21.novalocal	disk2	0.00991	0.00000	30	0	0.00033	0.00000
client-21.novalocal	disk3	0.00000	0.00000	0	0	0.00000	0.00000
client-21.novalocal	disk4	0.00000	0.00000	0	0	0.00000	0.00000
client-21.novalocal	disk5	0.00115	0.00000	3	0	0.00038	0.00000
client-22.novalocal	disk10	0.00357	0.00000	3	0	0.00119	0.00000
client-22.novalocal	disk6	0.00000	0.00000	0	0	0.00000	0.00000
client-22.novalocal	disk7	0.00000	0.00000	0	0	0.00000	0.00000



If it's desirable to see historical charts, you can select "Attribute Details" tab as shown in the screen shot below, choose "Historical" type, and then choose chart. Select Data Set and Attributes of interest, and then click on "Preview Results". You can see the historical chart

displayed at the following screen shot. Please note, by default it shows the last 4 hours of data. You can click on the pulldown right beside the “Last 4 hours” and choose a different window.



All My Applications > My Components > Components > ESS >

sapm-apm3:EH

Integrate with OA-LA to enable log searches

Status Overview | Events | Custom Views | Attribute Details

KEH_CPUUSAGE

Last Saved: Save date unknown

Last Refresh: Dec 10, 2019, 5:09:32 PM

Last 4 hours