Here is an update from STR regarding some changes to the performance metrics capturing process and Login-Enterprise dashboards during James PTO

TL/DR

- We are now able to capture Nutanix Files performance stats using prometheus and our testing framework.
- For large scale testing, we have the option to zoom in to details using a separate Grafana instance, managed by the Durham Perf team.

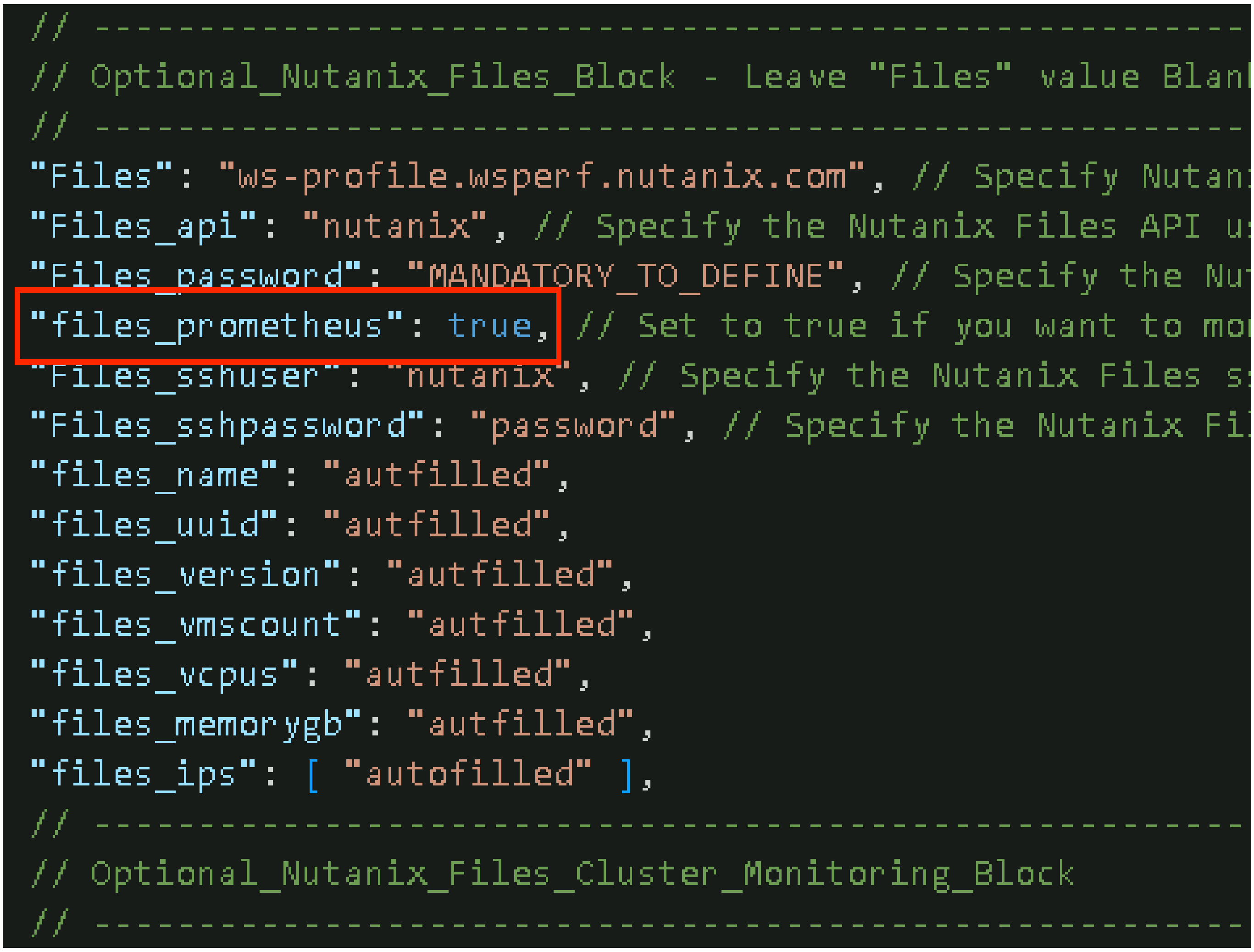
This was achieved by taking the following steps:

Step 1: starting and stopping the prometheus exporters on the Files VMs

Since Files version 5, there are 2 prometheus node exporters installed, but are disabled by default:

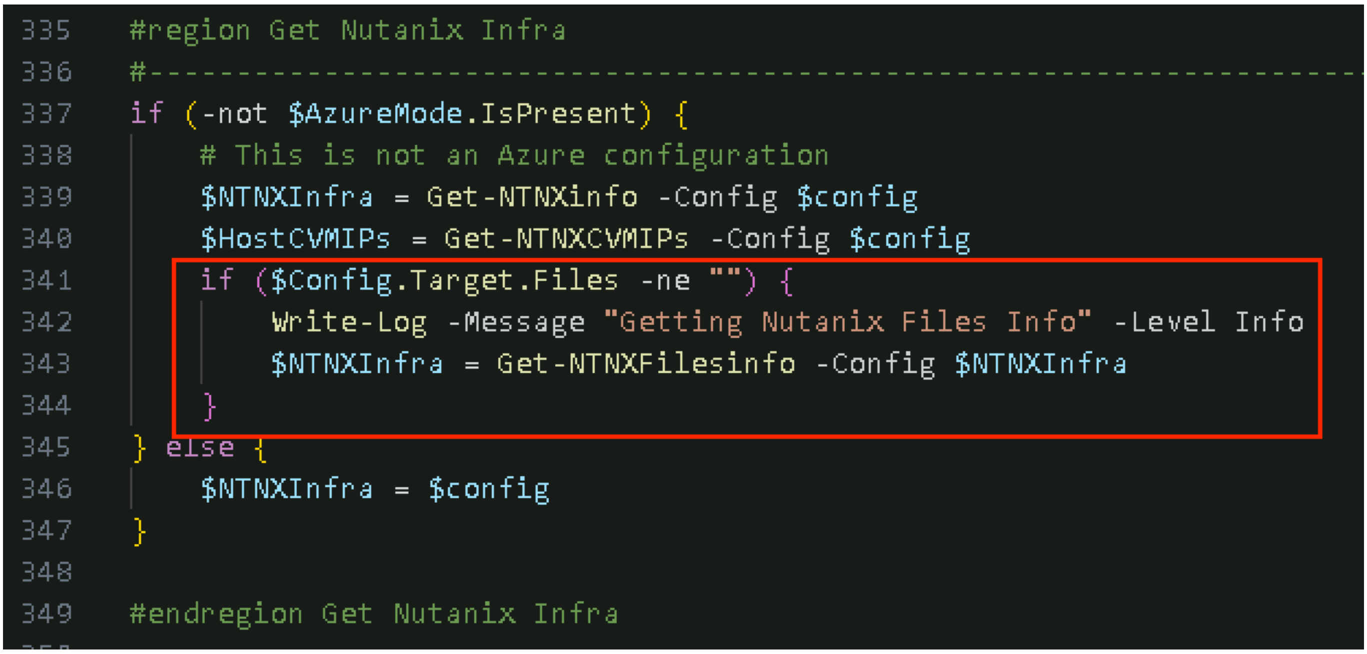
- node_exporter
- nutanix-files_exporter

When enabled, Prometheus can be used to capture detailed performance stats. We don't want to enable this for all our tests, so I made it an option to enable the exporters by setting the following value: `"files_prometheus": true`



```
// ---------------------------------------------------------
// Optional_Nutanix_Files_Block - Leave "Files" value Blan
// ---------------------------------------------------------
"Files": "ws-profile.wsperf.nutanix.com", // Specify Nutan
"Files_api": "nutanix", // Specify the Nutanix Files API u
"Files_password": "MANDATORY_TO_DEFINE", // Specify the Nu
"files_prometheus": true, // Set to true if you want to mo
"Files_sshuser": "nutanix", // Specify the Nutanix Files s
"Files_sshpassword": "password", // Specify the Nutanix Fi
"files_name": "autfilled",
"files_uuid": "autfilled",
"files_version": "autfilled",
"files_vmscount": "autfilled",
"files_vcpus": "autfilled",
"files_memorygb": "autfilled",
"files_ips": [ "autofilled" ],
// ---------------------------------------------------------
// Optional_Nutanix_Files_Cluster_Monitoring_Block
// ---------------------------------------------------------
```

As you can see, I've added some more file parameters that will be autofilled using this function in the `Invoke-Test.ps1` script:



```
#region Get Nutanix Infra
#--------------------------------------------------------------------------
if (-not $AzureMode.IsPresent) {
    # This is not an Azure configuration
    $NTNXInfra = Get-NTNXinfo -Config $config
    $HostCVMIPs = Get-NTNXCVMIPs -Config $config
    if ($Config.Target.Files -ne "") {
        Write-Log -Message "Getting Nutanix Files Info" -Level Info
        $NTNXInfra = Get-NTNXFilesinfo -Config $NTNXInfra
    }
} else {
    $NTNXInfra = $config
}

#endregion Get Nutanix Infra
```

The function `GetNTNXFilesinfo` will get the details from the Files cluster and put that back into the `$NTNXInfra` variable. For the `prometheus.yml` file, we need `files_name`, `files_uuid` and `files_ips`. We'll get to that in the next step, first we want to be able to start and stop the monitoring services on the files cluster. To be able to do this, we need to connect to the Files cluster using SSH. After installing a Files cluster, you'll need to run the following command on one of the files VMs (this is also in the test-config template file as a comment):

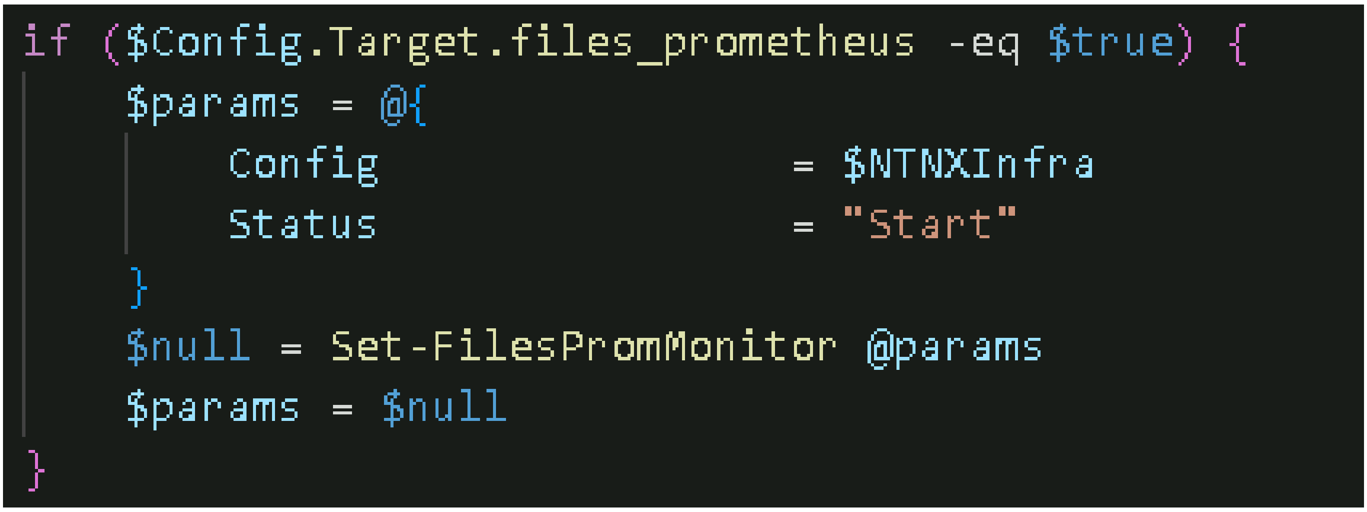
`allssh "afs misc.ssh_on_client_network enable"`

You can do this by connecting to one of the CVMs hosting the files cluster first, and then ssh into one of the FSVMs. While you are still logged on to a FSVM, also run the following command:

`edit-afs-gflags minerva_nvm minerva_enable_files_metrics_on_release True`

This will allow us to start and stop the monitoring services on the FSVMs.

Now that we are able to ssh into a FSVM, the following function is used to start or stop the monitoring services:



```
if ($Config.Target.files_prometheus -eq $true) {
    $params = @{
        Config                  = $NTNXInfra
        Status                  = "Start"
    }
    $null = Set-FilesPromMonitor @params
    $params = $null
}
```

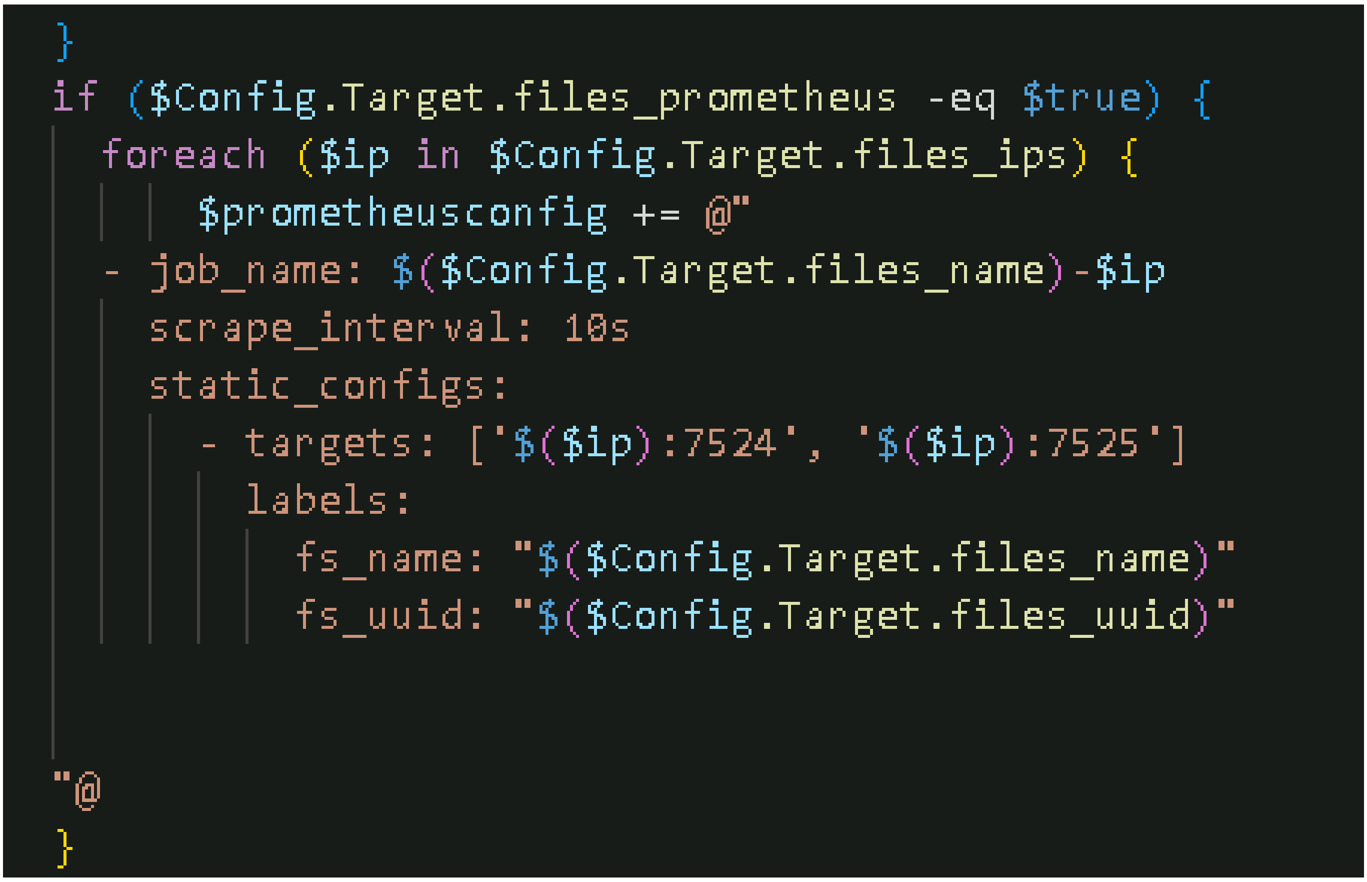
This function will send the following command to start: `~/minerva/bin/edit-afs-gflags minerva_nvm minerva_files_metrics_enabled True`

And this command to stop: `~/minerva/bin/edit-afs-gflags minerva_nvm minerva_files_metrics_enabled False`

If you want to check if the monitoring services are started, you can check by running these commands on the FSVMs: sudo systemctl status node_exporter sudo systemctl status nutanix-files_exporter

Step 2: Add the Files VMs as targets to our Prometheus instances

The `Set-ObserverMonitor` function has been modified. It will now check for `$Config.Test.StartObserverMonitoring` value set to `$true`, and it will add the CVM parts to the `prometheus.yml` file. If the `$Target.files_prometeus` value is set to true, it will add the Files monitoring target to the `prometheus.yml` file:



```
}
if ($Config.Target.files_prometheus -eq $true) {
  foreach ($ip in $Config.Target.files_ips) {
      $prometheusconfig += @"
  - job_name: $($Config.Target.files_name)-$ip
    scrape_interval: 10s
    static_configs:
      - targets: ['$($ip):7524', '$($ip):7525']
        labels:
          fs_name: "$($Config.Target.files_name)"
          fs_uuid: "$($Config.Target.files_uuid)"


"@
}
```

Port `7524` and `7525` are the individual exporter services, running on the FSVMs.

Step 3: Add variables to our Tests status grafana dashboard to be able to filter on Files Server instances

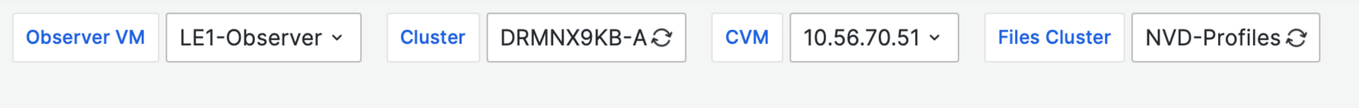
To be able to use the queries from the Durham Files Performance Team grafana dashboard, I needed to add these variables to our `Test Status` dashboard:

fs_name	label_values(node_cpu_seconds_total,fs_name)
fs_uuid	label_values(node_cpu_seconds_total{fs_name="$fs_name"},fs_uuid)
I_R_I	irate, rate, increase
range	15s,30s,1m,2m,5m,10m,15m,20m,25m,27m,28m,30m,1h,1d,5d
grafana_ip	10.51.16.17

The `grafana_ip` mentioned is the ip address of the Files team dashboard. This is used to link to the `Debug` dashboard.

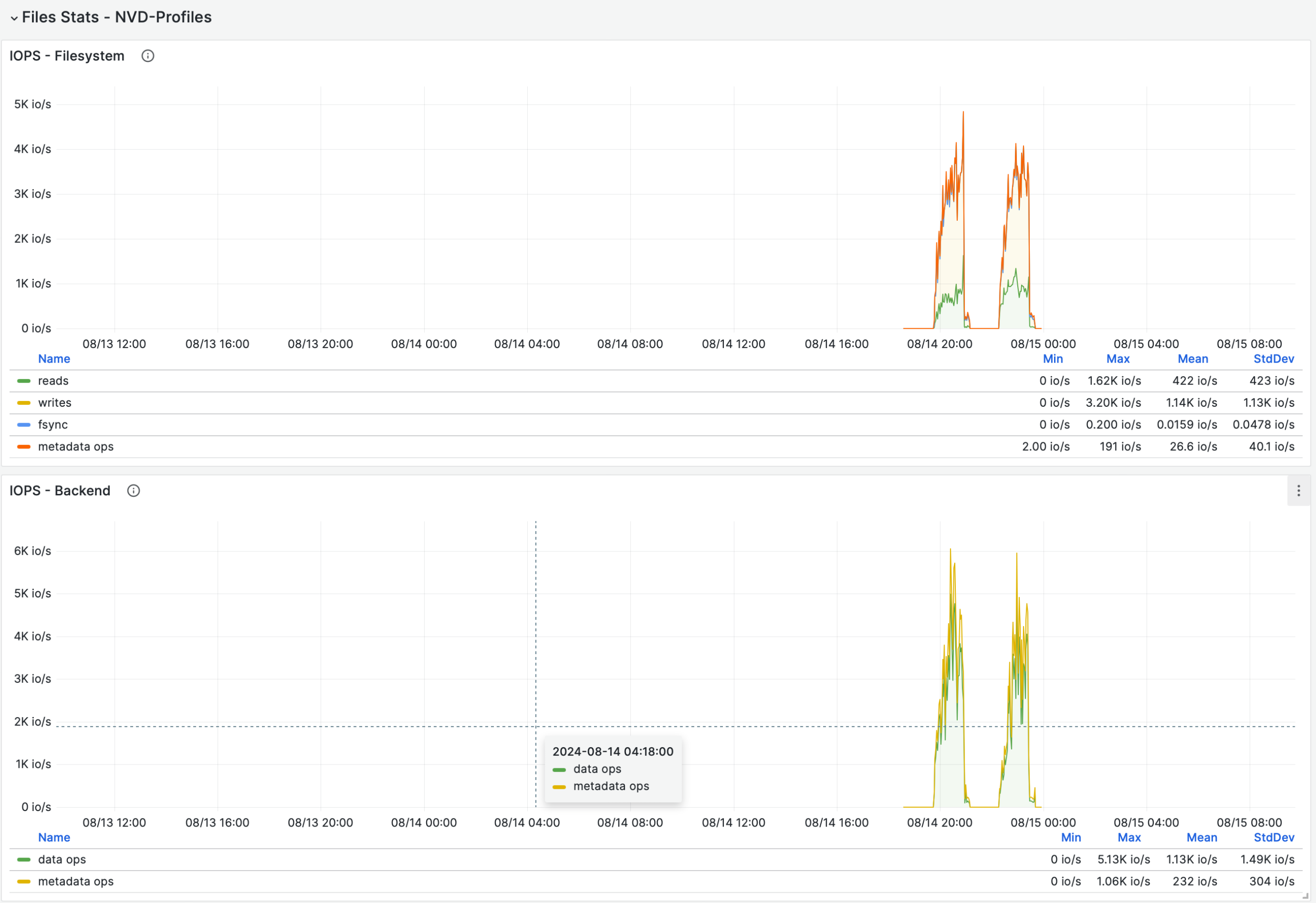
Step 4: Add Nutanix Files panels to our Test status with some high level performance stats

The File server name value is added as a filter in the `Test Status` dasboard. If you select a time window and an Observer-VM that has captured a Files cluster for monitoring, this will be filled:



Observer VM: LE1-Observer
Cluster: DRMNX9KB-A
CVM: 10.56.70.51
Files Cluster: NVD-Profiles

You'll see that the `Files Stats` Row is now filled with graphs:

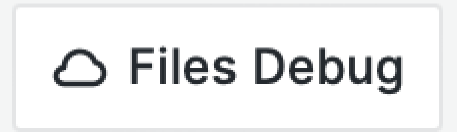


Name	Min	Max	Mean	StdDev
reads	0 io/s	1.62K io/s	422 io/s	423 io/s
writes	0 io/s	3.20K io/s	1.14K io/s	1.13K io/s
fsync	0 io/s	0.200 io/s	0.0159 io/s	0.0478 io/s
metadata ops	2.00 io/s	191 io/s	26.6 io/s	40.1 io/s

Name	Min	Max	Mean	StdDev
data ops	0 io/s	5.13K io/s	1.13K io/s	1.49K io/s
metadata ops	0 io/s	1.06K io/s	232 io/s	304 io/s

Step 5: Link to the Durham Perf Team Grafana instance for Debug stats

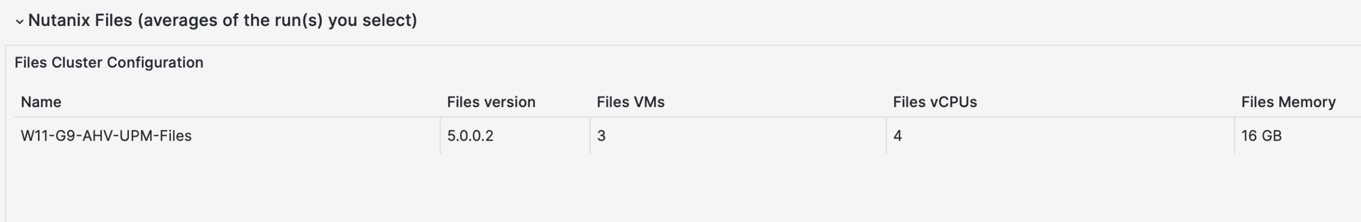
I've added 8 panels that will give us some insights. If you want to dive deeper, you can click on the `Files Debug` link on the top right corner. This will only work for the LE1-Observer, but we're doing the large Files tests on the LE1 anyway.



When you click it, it will take the current Files Cluster selection and time frame to the Debug page. There are some crazy panels over there, so knock yourself out!

One more thing: Also add the Files cluster info to the Login Documents dashboard

As I was capturing the info anyway, I added the Files Cluster info to the `Login Documents` dashboard:



⌄ Nutanix Files (averages of the run(s) you select)

Files Cluster Configuration

Name	Files version	Files VMs	Files vCPUs	Files Memory
W11-G9-AHV-UPM-Files	5.0.0.2	3	4	16 GB