



Hewlett Packard
Enterprise

Data Center Automation Suite 2016.10

**Linux Remediation Performance
Characterization**

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Summary of performance results

HPE tested the Linux Software Remediate functionality of Data Center Automation Suite (DCA) version 2016.10 in the HPE Performance lab. The aim was to validate the overall throughput and resource demand for a well-defined workload.

The DCA Suite 2016.10 is a virtual appliance that provisions and manages servers and data center operations more effectively.

In this study, the HPE Performance team exercised the capabilities of DCA Operations Portal, Operations Orchestration and Server Automation in a software remediation scenario for Linux-based managed servers. With DCA Operations Portal you can remediate software on managed servers by leveraging the Software Policy remediation feature in Server Automation.

The throughput data was measured at DCA Operations Portal level. This white paper details the analysis of the Linux Software Remediation performance capabilities.

For the hardware configuration specified in **Appendix: Test system configuration**, the tested remediation job achieved a maximum throughput of 29.84 servers/minute for a workload of 1000 RHEL 6.7 x86_64 managed servers.

Test case description

The HPE Performance team selected the following test case to remediate a set of managed servers. The test case used one software policy containing a single .zip file. The team measured throughput and system resource utilization at different load levels for throughput profiling.

The implemented Software Remediation test case:

- concurrently remediates a software policy on the following load levels of managed servers: 1, 100, 200, 500 and 1000.
- uses a single software policy on each server load level. This software policy is one single .zip file of 100 MB.
- runs on RHEL67 x86_64 OS managed servers.
- runs on virtual machines managed servers hosted in the HPE Performance lab.

All remediate jobs were submitted via the DCA UAPI.

Performance results

Job throughput is measured in number of managed servers processed per minute. This is computed by dividing the number of managed servers on which the job is run by the total execution time of the job.

Overall job throughput

The overall job throughput represents an average of two iterations for each load level: 1, 100, 200, 500 and 1000 managed servers.

The highest achieved throughput is 29.84 servers/minute at a workload of 1000 managed servers.

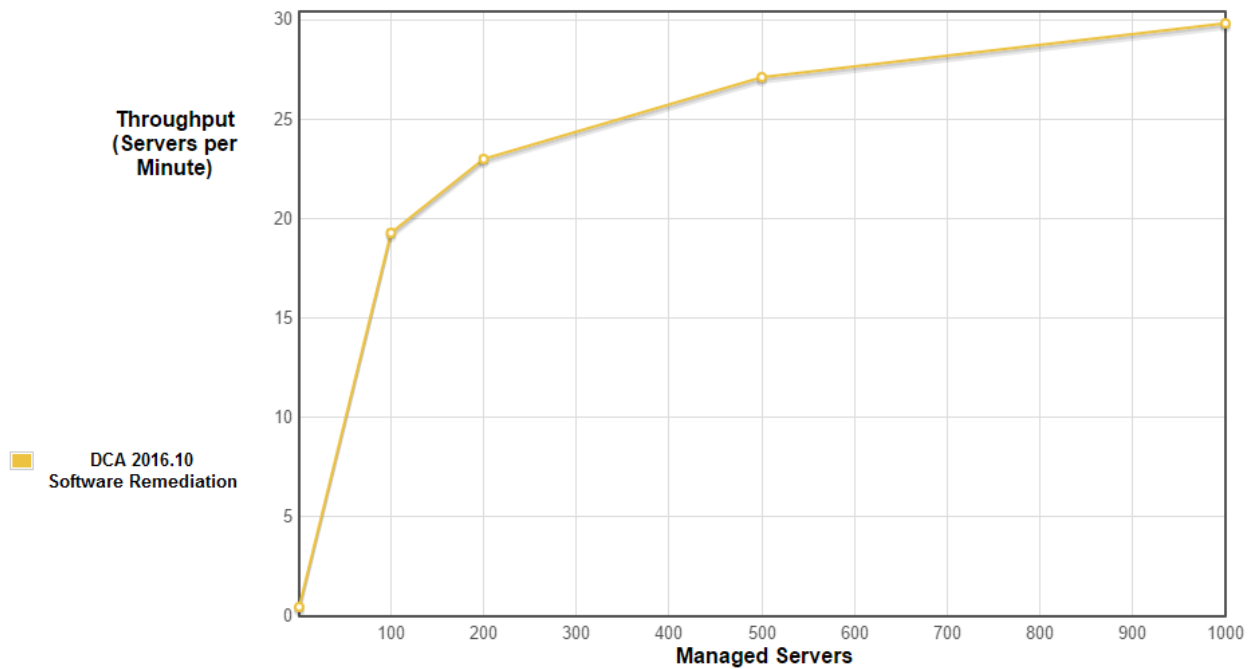


Figure 1: DCA Linux software remediation job throughput

Resource utilization on DCA Virtual Appliance

Remediation in DCA is characterized by a balanced system resource demand on the DCA Virtual Appliance, where the DCA Operations Portal, Operations Orchestration and Server Automation applications share hardware resources managed by the same operating system.

The following graphics show the CPU and network utilization for a DCA server processing a software remediation job on 100 managed servers.

For a detailed analysis on the performance of a software remediation job at Server Automation level, see the *HPE SA 10.50 Linux Remediation Performance Characterization* whitepaper.

CPU utilization on a DCA server running a software remediation job for 100 managed servers

As highlighted in Figure 2, a software remediation flow in DCA starts with low to moderate CPU utilization. This corresponds to the job preparation stage.

As the remediation job reaches the staging (download) phase, the CPU utilization spikes and the utilization remains high during the execution of the remediation job. As soon as the compliance phase is over and the DCA remediation flow moves into the completion phase, the CPU demand drops to low values.

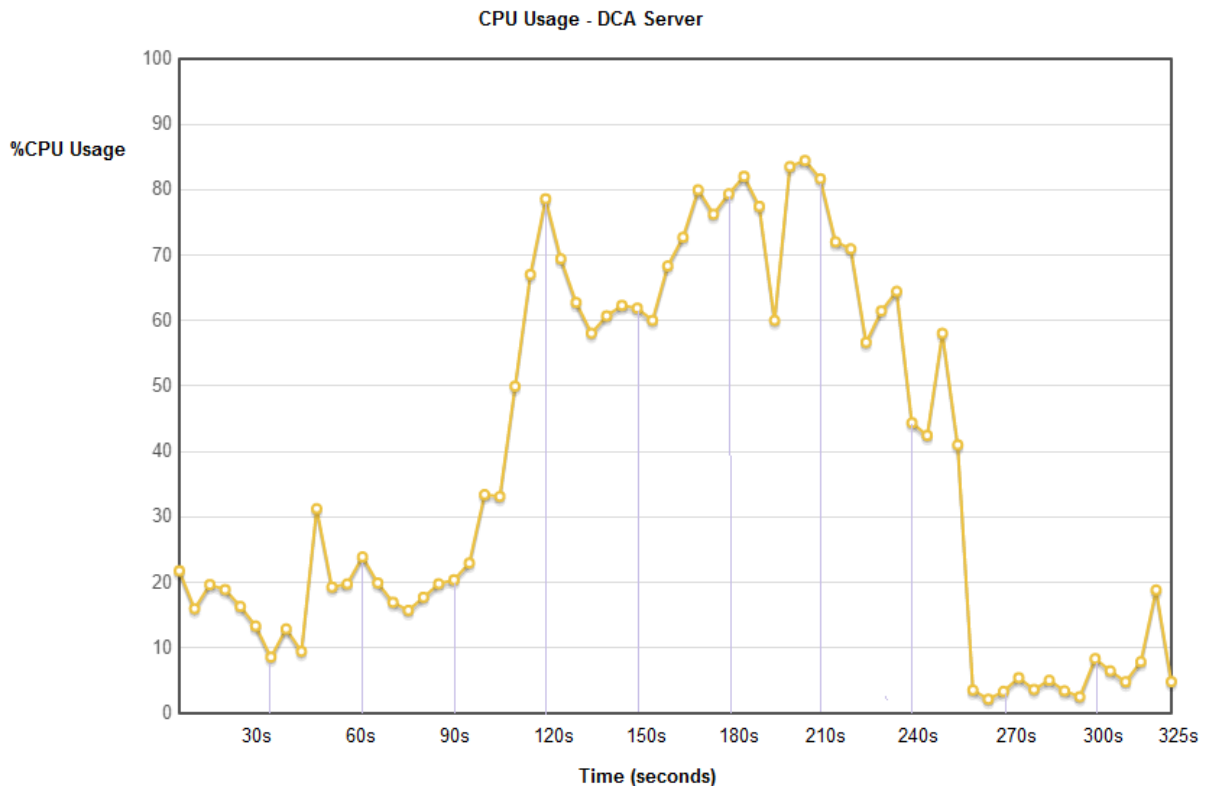


Figure 2: CPU utilization for a DCA server while performing a software remediation on 100 managed servers

Network utilization on a DCA server running a software remediation job with 100 managed servers

Figure 3 shows the network utilization pattern during a software remediation flow. The utilization spikes correspond to the download phase of the remediation job, reaching close to 160 MB/s in the tested environment.

Payload is downloaded in batches on target managed servers, ranging throughout the second quarter of the total duration of the job.

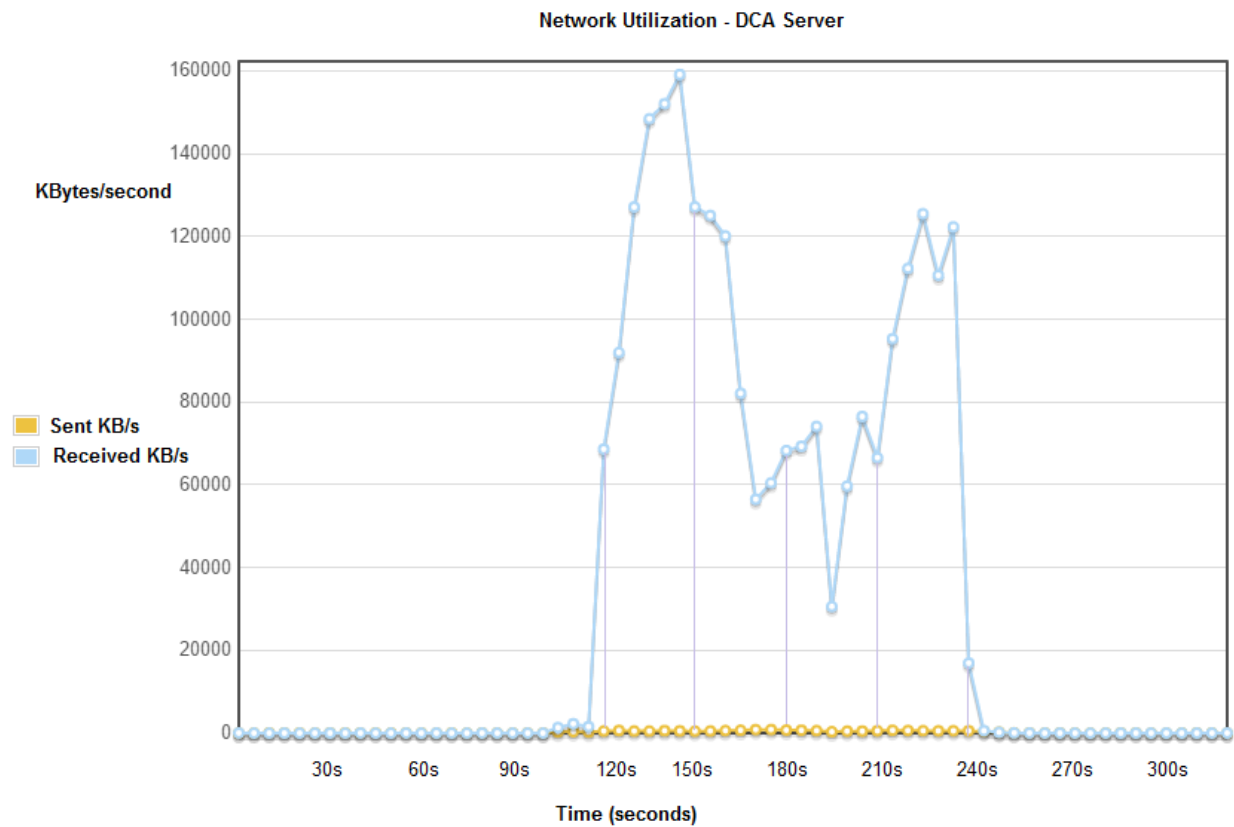


Figure 3: Network utilization for a DCA server while performing remediation on 100 managed servers

Tunable configuration parameters

The HPE Performance team adjusted the following system configuration parameters to facilitate stable operations:

Increase SA Device Remediation timeout at DCA level

DCA Administration Portal enables you to configure the SA Remediation timeout parameter¹.

Increase Server Automation *way.remediate.package_alarm_timeout*

The remediate operation includes the action phase, which implies a workload on the managed server proportional to the payload being remediated.

When the number of managed servers in a job is large enough, this operation may reach the default timeout value of 3600 seconds. In this study, this value has been increased to 10200 seconds. You can turn off the value of this parameter from the SA Client².

Increase Server Automation *way.remediate.get_dicts_timeout*

The *get_dicts_timeout* tuning parameter in SA is similar to *package_alarm_timeout*. It limits the number of seconds allowed for getting a list of installed software in the remediation action phase.

By default, this parameter is set to 1800 seconds but has been increased to 7200 seconds to work around timeout issues encountered at heavy workload levels. You can change the value of this parameter from the SA Client³.

This test uses the default parameters for all the other configuration parameters.

Conclusions

For concurrent operations on a number of managed servers, DCA software remediation achieves a steady state with a maximum throughput of **29.84 servers per minute** at a workload level of 1000 RHEL 6.7 64-bit managed servers. This throughput is computed in the context of a well-defined 100 MB payload.

The resource utilization on the DCA server looking at CPU and network utilization is moderate to high throughout the remediation job for the tested scenario.

¹ Designs > Sequenced > Resource Offerings > Managed Servers > Lifecycle > Provisioning Stages / Deploying > During > SA Device Remediation

² Administration View > System Configuration / Configuration Parameters > *way.remediate.package_alarm_timeout*

³ Administration View > System Configuration / Configuration Parameters > *way.remediate.get_dicts_timeout*

Appendix: Test system configuration

DCA Server

ESXi host specs	<ul style="list-style-type: none"> • ESXi 5.1 • HW: Model: HP ProLiant BL460c Gen9 • CPU: 16 CPUs x 2.6 GHz Intel Xeon E5-2640 • Memory: 256 GB
VM specifications	<ul style="list-style-type: none"> • Disk: 256 GB Linux ext4 • CPU: 8x vCPU @ 2.60GHz , Memory: 32 GB
Network configuration	Network: 10 GBPS LAN, dedicated VLAN
Software specifications	<ul style="list-style-type: none"> • OS: CentOS 6.5 64-bit • DCA Suite 2016.10

Managed servers

Managed servers	RHEL 6.7 VMware VMs
ESXi host specifications	<ul style="list-style-type: none"> • ESXi 5.1 • HW: Model: HP ProLiant BL460c Gen8 • CPU: 16 CPUs x 2.6 GHz Intel Xeon E5-2670 • Memory: 192 GB
VM specifications	<ul style="list-style-type: none"> • Local Disk: 20 GB Linux ext4 • CPU: 1 vCPU @ 2.60GHz , Memory: 2 GB
Network configuration	Network: 10 GBPS LAN, dedicated VLAN
Software specifications	OS: RHEL 6.7 64-bit
Additional notes	VMs are evenly distributed across 28 VMware ESXi hosts

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Feedback on Linux Remediation Performance Characterization White Paper (Data Center Automation Suite 2016.10)

Just add your feedback to the email and click send.

If no email client is available, copy the information above to a new message in a web mail client, and send your feedback to hpe_sa_docs@hpe.com.

We appreciate your feedback!

