User Guide and Release Notes
DataCore™ MaxParallel™ Software R3.0

Version Summary	Date
Version R3.0 Build 16313	Mar 6, 2018

This document includes the following sections:

Overview	General overview of this product
Configuration Notes	Important configuration notes for this release
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Overview

DataCore™ MaxParallel™ Software

MaxParallel™ software improves the responsiveness of server workloads bogged down by I/O bottlenecks in the operating system, while reducing infrastructure cost through more productive use of server cores and memory.

Experience the benefits overnight from the plug-n-play product without any changes to the applications, hardware, or data.

Configuration Notes

System Requirements

- Both physical and virtual machines are supported.
- 4 or more vCPUs (virtual CPUs or physical cores). Increasing the core count will improve performance by increasing parallelism.
- x64 architecture (Itanium processors are not supported).
- 8 GB or more of RAM.
- Microsoft Windows Server 2008 R2 SP1, 2012, 2012 R2 or 2016 Operating Systems in Standard or DataCenter editions.
    - For Windows 2008 R2 SP1 systems, install Windows Management Foundation which includes PowerShell 4.0 (**Windows Management Foundation**).
    - MaxParallel is not supported on Microsoft Windows Core.
- Supported Disk Configurations:
    - 512- or 4K- byte block disks
    - Basic or Dynamic disks
    - MBR or GPT disks
    - Disks in soft RAID (R0, R1, R5)
    - Any file system
    - Any number of partitions

Configuration Considerations

- Do not install MaxParallel software on systems running Microsoft Clusters with cluster disks in use.
- If the minimum core and RAM requirements are not met, MaxParallel software will not start.
- If CPU utilization is >80% before using MaxParallel software, performance improvements may not be realized
- MaxParallel software cannot be installed on a server with some DataCore products installed, including SANsymphony, Hyper-converged virtual SAN and the Windows Integration Kit, prior to version 4.0 Update2.
- MaxParallel software cannot be installed on any server with Microsoft Active Directory Domain Services.
- MaxParallel software cannot be used on disks used simultaneously by more than one server, i.e. shared storage.
- When running MaxParallel software in a virtual machine, use static memory allocation. Dynamic memory allocation is incompatible with the way MaxParallel software works.
- MaxParallel software will not accelerate removable media.
- Antivirus or malware protection software may interfere with installation. To prevent this, exclude all DataCore installation folders (e.g. C:\Program Files\DataCore…) from any antivirus or malware protection software.
- DataCore recommends that servers are connected to an appropriately sized UPS system.

Installation and Upgrading

Note: Log in to the system with the local Administrator account for the installation and management of MaxParallel software.

Follow these steps to install or upgrade MaxParallel:

1) Ensure that all hardware and software requirements are met.
2) Apply the latest operating system updates and hotfixes.
3) Copy the executable (MaxParallel.exe) to the desktop.
4) Double-click the executable to begin the installation or upgrade.
5) Accept the EULA, and allow the installation of .NET 4.6.1 if needed. Note: To perform a scripted installation, execute MaxParallel.exe **\scripted** from an elevated command prompt.
6) During the installation, a Windows Security alert as shown below may be displayed.
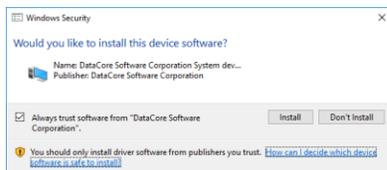
DataCore Software drivers are registered and signed with Digicert Inc. (https://www.digicert.com), a trusted certification authority. This validates the origin and authenticity of the DataCore product you are installing. Click "**Install**" to proceed.

7) Restart the system when prompted. This completes the installation. Note: A scripted install will not prompt for this required reboot.
8) On first reboot, a Quick Start Guide will be displayed.
9) The MaxParallel icon will appear in the system tray.
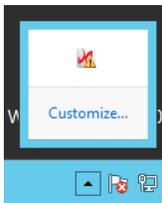
10) The tray application will display a waiting indicator until the software has fully initialized.
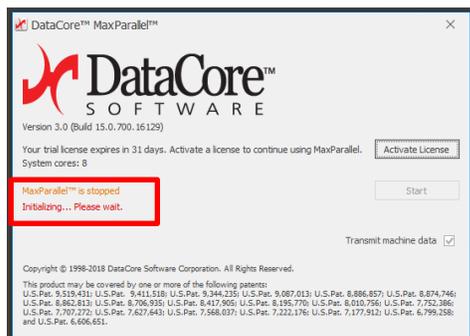
On a new installation following the reboot, the MaxParallel software will not automatically start until the software is manually started from the tray application. After a system reboot or upgrade, MaxParallel will retain the current state prior to the restart.

Uninstalling MaxParallel

Follow these steps to uninstall MaxParallel:
1) Using Add/Remove Programs, uninstall MaxParallel. A scripted uninstall may be performed by executing **MaxParallel.exe /uninstall \scripted** from an elevated command prompt.
2) Reboot to finish the uninstallation.

Note: To uninstall the MaxParallel Dashboard from Windows Server 2016 systems when MaxParallel is not also installed, execute **MaxParallel.exe /uninstall** from an elevated command prompt.

Managing the MaxParallel Software

Disk Management

MaxParallel services are automatically enabled for all supported disk types. The CLI may be used to disable or re-enable MaxParallel services on specific disks. Refer to Appendix A: Command Line Interface Reference.

Using the MaxParallel System Tray Icon

Right-clicking on the MaxParallel system tray icon brings up a menu with the following operations:

- Launch Dashboard
- Start MaxParallel Services
- Stop MaxParallel Services
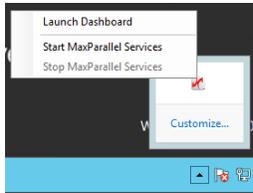
Start/Stop MaxParallel Services

To enable MaxParallel software services, select the **Start** option from the tray icon menu or from the Management Dialog window. By default, MaxParallel software is turned on for supported types of disks. MaxParallel software services may be disabled by selecting **Stop** from the tray icon menu or from the Management Dialog window.

Launch Dashboard

Selecting the Launch Dashboard option opens the MaxParallel Dashboard. See Appendix A below for details.
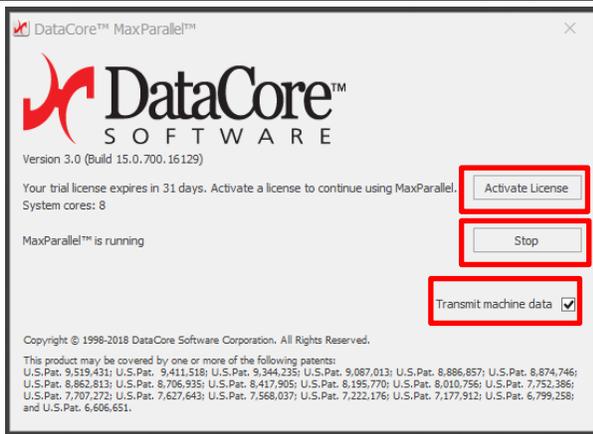
Management Dialog

Clicking on the MaxParallel system tray icon brings up the Management Dialog window. From this window, system and license information is displayed. Licenses may be activated and the MaxParallel software may be started or stopped. Additionally, transmission of machine data may be enabled or disabled (the default is enabled).

Notes:
MaxParallel software may collect, transmit, process and analyze anonymous or aggregated machine data, including log data, system and application information, performance statistics and other information about system configuration for the purposes of making the software and the system more responsive and productive.
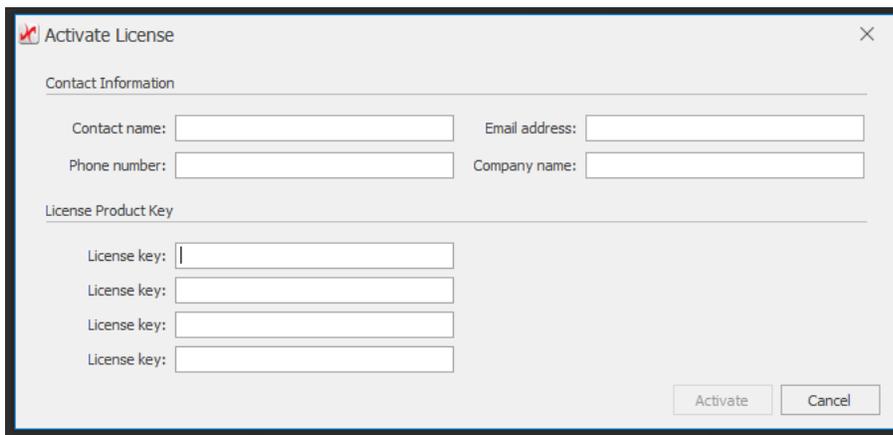
TCP Port 443 must be open in order to transmit data.

Clicking the **Activate License** button in the MaxParallel Management dialog produces the Activate License dialog**.**
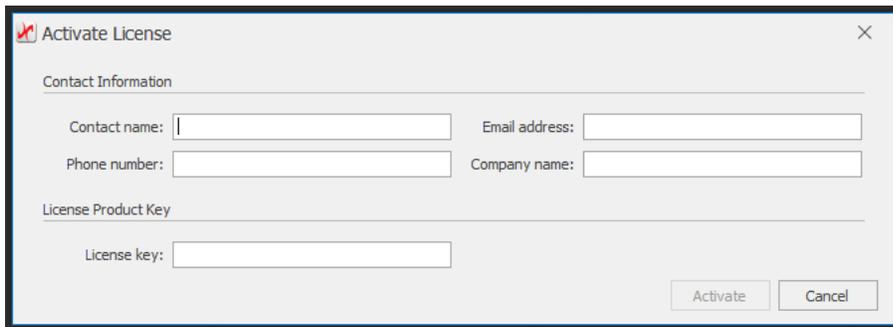
If entering additional core license keys, a new dialog box is displayed after each valid license is entered.

An end-user license agreement will be displayed after the **Activate** button is clicked. When the terms are agreed to, the **Activate** button will be enabled. When **Activate** is clicked, the license will be confirmed and will be enabled on the system.

Known Issues

- Trim operations on SSD are disabled in this release of MaxParallel software.

Appendix A: MaxParallel™ Dashboard

The MaxParallel Dashboard is a web-based performance monitoring utility. It may be opened from a shortcut on the desktop, the system tray or the start menu. MaxParallel Dashboard installs a service that provides data to the web application. The web page presents several metrics to benchmark a system with and without MaxParallel software running.

MaxParallel Dashboard Notes:

- Supported browsers include the latest versions of Microsoft Internet Explorer, Google Chrome and Mozilla Firefox. Note: if the dashboard is blank, check that Java scripting is enabled in the browser settings.
- The white marker indicates the snapshot average for the previous state of MaxParallel (active or inactive).
- The blue needle indicates the current average.
- The maximum improvement percentage is 999%, however a greater percentage is possible and will be displayed as >999%.

Graphics

Read Requests/sec: The rate of read operations on all disks. It is the read component of Total IOPS. Higher values represent an increase in work performed.

Write Requests/sec: The rate of write operations on all disks. It is the write component of Total IOPS. Higher values represent an increase in work performed.

Total IOs/sec: The rate of read and write operations on all disks. Higher values represent an increase in work performed.

Average Read Latency (ms): Average time, in milliseconds, of a read of data measured across all disks. Using MaxParallel™ can lower average wait times.

Average Write Latency (ms): Average time, in milliseconds, of a read of data measured across all disks. Using MaxParallel™ can lower average wait times.

Total Throughput: The rate bytes are transferred to or from disks during I/O operations, measured across all disks. Higher values represent an increase in work performed.
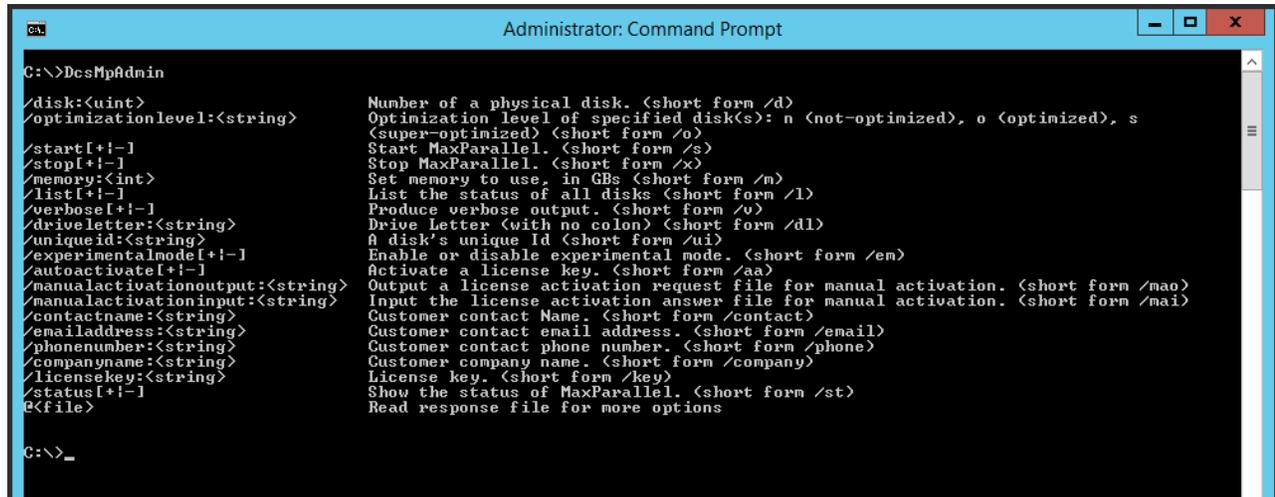
Settings

The default collection timeframe (Data Timeframe) is 60 seconds and the collection interval (Update Interval) is every 5 seconds. Clicking the Settings icon (top right of the dashboard) allows these parameters to be modified. The Data Timeframe range is 60 to 300 seconds; the Update Interval range is 1 to 10 seconds. Use the slider to set the desired settings and click **Save.**

Appendix B: Command Line Interface Reference

The MaxParallel Command Line Interface (CLI) utility is used for advanced control and configuration of the MaxParallel service. Most users will not need to use the MaxParallel CLI. Open an elevated (Administrative) command prompt to enter the **DcsMpAdmin.exe** command. All options are arguments to the executable. Output from CLI commands are logged.

A simplified help screen is available by executing the utility alone from the command line. Output from CLI commands are logged.

Notes:

- Use an Administrative ("elevated") command prompt for DcsMpAdmin.exe.
- The command path is appended to the system path during installation so that DcsMpAdmin can be executed without specifying or changing to its directory.
- DcsMpAdmin.exe accepts, and in some cases requires, multiple directives, each directive preceded by a '/' (forward slash) character.
- If a directive requires an argument, use a colon between the directive and the argument.
- Enclose arguments containing spaces in double quotes.

Directives

Directives are not case-sensitive. Each directive has a long and a short form, and are loosely categorized into:

- o Informational Directives
- o Control Directives
  - System Control
  - Disk Control
- o Licensing-Related Directives

Informational Directives

- /status (Short form: /st)
- /list (Short form: /l)

The **/status** directive shows a summary of the system's status.
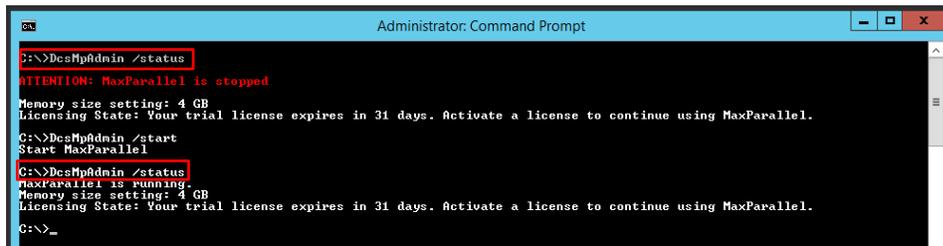
The **/list** directive gets information about all disks that that can be managed by MaxParallel software, along with disk identifier, drive letter if applicable, the optimization level, and size of the disks.

Disk is followed by its identification number. The number will correspond to the disk number seen in Disk Management. A disk number can, but will usually not, change across reboots. A change to the disk number is usually the result of a change to system configuration, for example, adding another disk.

A drive letter is another way of referring to disks. A drive letter can refer to a set of partitions spanning different sets of disks. This will be the most common and useful identifier for most uses. A directive issued with a drive letter identifier will affect all the partitions referred to by that drive letter, even if they span different disks.

Optimization may one of three levels: 'non-optimized', 'optimized, or 'super-optimized'.

Size is the size of the disk.

The **/verbose** directive (short form: /v) can be used with **/list** to show disk's optimization level and UniqueIDs. The UniqueID for a disk will not change.
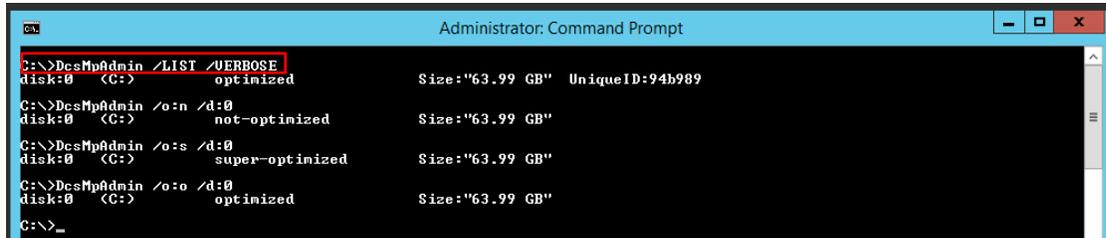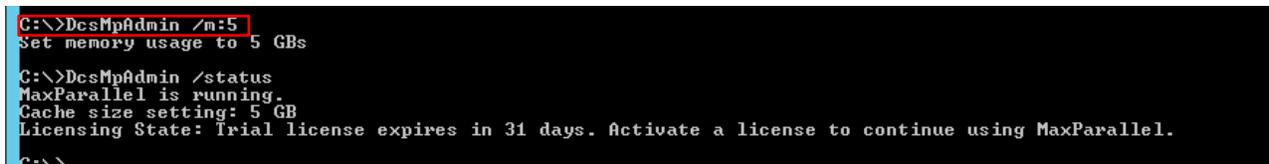

Control Directives

Control directives affect disks accelerated by MaxParallel software.

- /start (Short form: /s)
- /stop (Short form: /x)
- /memory:<integer>   (Short form: /m)
- /disk:<integer> (Short form /d)
- /optimizationlevel: <level> (Short form: /o)

/start and **/stop** enable and disable the MaxParallel service for the entire system. These commands correspond to toggling between **Start** and **Stop** using the tray app button or the right-click menu from the tray app icon.

/memory:<integer> sets the amount of system memory used by MaxParallel software, specified in whole gigabytes. This setting cannot be less than the required 4GB or the MaxParallel services will not start.

Disk Control Directives

- **/optimizationlevel**:<string> (Short form: /o)

The disk control directive is used to control the level of acceleration by MaxParallel on a specific disk.
The optimization level can be set to one of three levels:

> **non-optimized** – MaxParallel optimization is disabled
> **optimized** – MaxParallel optimization is enabled (default)
> **super-optimized –** Additional MaxParallel optimization is enabled which may deliver a higher level of performance. However a power outage or equipment failure might result in data loss or corruption.

Important Note: Modifying the optimization level while MaxParallel is active may affect I/O processing while moving from one level of optimization to the next. To ensure maximum performance for an application, stop MaxParallel before changing optimization levels.

To use this directive the disk to be affected must be specified with one of the disk identification directives below.

Disk Identification Directives

- /disk:<integer> (Short form:/d)
- /driveletter:<string> (Short form: /dl
- /uniqueid:<string> (Short form: /ui)

Licensing-Related Directives

Note: If running MaxParallel in trial mode, after the trial expiration period, all optimization will be stopped until a license is purchased. To purchase a license, contact DataCore Software or your DataCore Solution Provider.

These commands provide different ways of activating a license:
- /autoactivate (Short form: /aa)
- /manualactivationoutput:<string> (Short form: /mao)
- /manualactivationinput:<string> (Short form: /mai)

/autoactivate can be used from systems connected to the Internet.

Manual activation directives should be used when the MaxParallel server is not connected to the Internet or a firewall blocks access to the automatic license activation service.
/manualactivationoutput creates a file named by the <string> argument that can be copied to external storage and subsequently uploaded to the DataCore licensing server. A license is generated that can be copied back onto the non-Internet-connected machine and applied using

/manualactivationinput:<string> (Short form: /mai), where <string> is the name of the licensing file to be applied.

Both commands **/autoactivate** and **/manualactivationoutput:<string>** require all of the following directive/argument pairs:

- /contactname:<string> (Short form: /contact)
- /emailaddress:<string> (Short form: /email)
- /phonenumber:<string> (Short form: /phone)
- /companyname:<string> (Short form: /company)
- /licensekey:<string> (Short form: /key)

Strings that contain spaces must be enclosed by quotes.   For example, /companyname:"DataCore Software Corporation"

Examples:

Auto activation:
```
dcsmpadmin /autoactivate /emailaddress:jdoe@company.com /companyname:"Company"  /key:XXXXX-XXXXX-
XXXXX-XXXXX-XXXXX /phonenumber:5551234567 /contactname:"John Doe"
```

Manual activation:
1) Create the license.info file:
```
dcsmpadmin /manualactivationoutput:"C:\<path>\license.info /contactname:"John Doe"
/companyname:"Company Name" /key:XXXXX-XXXXX-XXXXX-XXXXX-XXXXX /phonenumber:5551234567
/emailaddress:jdoe@company.com
```
2) Copy the file to a server with Internet access and open **https://www.datacore.com/ssvactivation.aspx** on the DataCore website. Follow the instructions on the License Activation page to generate a license file (<filename>.lic).
3) Copy the license file back to the MaxParallel server and execute the following:
```
dcsmpadmin /manualactivationintput:<filename>.lic
```