MATLAB® Distributed Computing Server™ Release Notes

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MATLAB® Distributed Computing Server™ Release Notes

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R2014a

Version: 6.4

New Features: Yes

Bug Fixes: Yes

Duplication of an existing job, containing some or all of its tasks

You can now duplicate job objects, allowing you to resubmit jobs that had finished or failed.

The syntax to duplicate a job is

```
newjob = recreate(oldjob)
```

where `oldjob` is an existing job object. The `newjob` object has all the same tasks and settable properties as `oldjob`, but receives a new `ID`. The old job can be in any state; the new job state is `pending`.

You can also specify which tasks from an existing independent job to include in the new job, based on the task IDs. For example:

```
newjob = recreate(oldjob,'TaskID',[33:48]);
```

For more information, see the `recreate` reference page.

More MATLAB functions enhanced for distributed arrays

The following functions now support distributed arrays with all forms of codistributor (1-D and 2DBC), or are enhanced in their support for this release:

```
eye
ifft
randi
rand
randn
```

Note the following enhancements for some of these functions:

- `ifft` and `randi` are new in support of distributed and codistributed arrays.

- `rand(___,'like',D)` returns a distributed or codistributed array of random values of the same underlying class as the distributed or codistributed array `D`. This enhancement also applies to `randi`, `randn`, and `eye`.

For a list of MATLAB® functions that support distributed arrays, see MATLAB Functions on Distributed and Codistributed Arrays.

Old Programming Interface Removed
Compatibility Considerations: Yes

The programming interface characterized by distributed jobs and parallel jobs has been removed. This old interface used functions such as `findResource`, `createParallelJob`, `getAllOutputArguments`, `dfeval`, etc.

Compatibility Considerations

The functions of the old programming interface now generate errors. You must migrate your code to the interface described in the R2012a Parallel Computing Toolbox™ release topic “New Programming Interface”.

`matlabpool` Function Being Removed
Compatibility Considerations: Yes

The `matlabpool` function is being removed.

Compatibility Considerations

Calling `matlabpool` continues to work in this release, but now generates a warning. You should instead use `parpool` to create a parallel pool.

Upgrade Parallel Computing Products Together
Compatibility Considerations: Yes

This version of MATLAB Distributed Computing Server™ software is accompanied by a corresponding new version of Parallel Computing Toolbox software.

Compatibility Considerations

As with every new release, if you are using both parallel computing products, you must upgrade Parallel Computing Toolbox and MATLAB Distributed Computing Server together. These products must be the same version to interact properly with each other.

Jobs created in one version of Parallel Computing Toolbox software will not run in a different version of MATLAB Distributed Computing Server software, and might not be readable in different versions of the toolbox software. The job data stored in the folder identified by `JobStorageLocation` (formerly `DataLocation`) might not be compatible between different versions of MATLAB Distributed Computing Server. Therefore, `JobStorageLocation` should not be shared by parallel computing products running different versions, and each version on your cluster should have its own `JobStorageLocation`.

R2013b

Version: 6.3

New Features: Yes

Bug Fixes: Yes

`parpool`: New command-line interface (replaces `matlabpool`), desktop indicator, and preferences for easier interaction with a parallel pool of MATLAB workers

Compatibility Considerations: Yes

This release introduces a number of enhancements for interacting with parallel pool resources. For more detailed descriptions of these enhancements, see parpool: New command-line interface (replaces matlabpool), desktop indicator, and preferences for easier interaction with a parallel pool of MATLAB workers in the Parallel Computing Toolbox release notes.

- Parallel pool syntax replaces MATLAB pool syntax for executing parallel language constructs such as `parfor`, `spmd`, `Composite`, and `distributed`. The pool is represented in MATLAB by a parallel.Pool object.
- A new icon at the lower-left corner of the desktop indicates the current pool status. Icon color and tool tips let you know if the pool is busy or ready, how large it is, and when it might time out. You can click the icon to start a pool, stop a pool, or access your parallel preferences.
- Your MATLAB preferences now include a group of settings for parallel preferences. These settings control general behavior of clusters and parallel pools for your MATLAB session. You can access your parallel preferences in the MATLAB toolstrip, from the parallel pool status icon, or by typing `preferences` at the command line.

  For more information, see Parallel Preferences.

Compatibility Considerations

This release continues to support MATLAB pool language usage, but this support might discontinue in future releases. You should update your code as soon as possible to use parallel pool syntax instead.

Automatic start of a parallel pool when executing code that uses `parfor` or `spmd`

Compatibility Considerations: Yes

You can set your parallel preferences so that a parallel pool automatically starts whenever you execute a language construct that runs on a pool, such as `parfor`, `spmd`, `Composite`, `distributed`, `parfeval`, and `parfevalOnAll`.

Compatibility Considerations

The default preference setting is to automatically start a pool when a parallel language construct requires it. If you want to make sure a pool does not start automatically, you must change your parallel preference setting. You can also work around this by making sure to explicitly start a pool with `parpool` before encountering any code that needs a pool.

By default, a parallel pool will shut down *if idle for 30 minutes*. To prevent this, change the setting in your parallel preferences; or the pool indicator tool tip warns of an impending timeout and provides a link to extend it.

Option to start a parallel pool without using MPI

Compatibility Considerations: Yes

You now have the option to start a parallel pool on a local or MJS cluster so that the pool does not support running SPMD constructs. This allows the parallel pool to keep running even if one or more workers aborts during `parfor` execution. You explicitly disable SPMD support when starting the parallel pool by setting its `'SpmdEnabled'` property `false` in the call to the `parpool` function. For example:

```
p = parpool('SpmdEnabled',false);
```

Compatibility Considerations

Running any code (including MathWorks toolbox code) that uses SPMD constructs, on a parallel pool that was created without SPMD support, will generate errors.

More MATLAB functions enabled for distributed arrays: `permute`, `ipermute`, and `sortrows`

The following functions now support distributed arrays with all forms of codistributor (1-D and 2DBC), or are enhanced in their support for this release:

`ipermute`	`zeros`
`permute`	`ones`
`sortrows`	`nan`
	`inf`
`cast`	`true`
	`false`

For more information about these functions and distributed arrays, see More MATLAB functions enabled for distributed arrays: permute, ipermute, and sortrows in the Parallel Computing Toolbox release notes.

Upgraded MPICH2 Version

Compatibility Considerations: Yes

The parallel computing products are now shipping MPICH2 version 1.4.1p1 on all platforms.

Compatibility Considerations

If you use your own MPI builds, you might need to create new builds compatible with this latest version, as described in Use Different MPI Builds on UNIX Systems.

Discontinued Support for parallel.cluster.Mpiexec

Compatibility Considerations: Yes

Support for clusters of type parallel.cluster.Mpiexec is being discontinued.

Compatibility Considerations

In R2013b, any use of parallel.cluster.Mpiexec clusters generates a warning. In a future release, support might be completely removed.

R2013a

Version: 6.2

New Features: Yes

Bug Fixes: Yes

Automatic detection and transfer of files required for execution in both batch and interactive workflows

Parallel Computing Toolbox can now automatically attach files to a job so that workers have the necessary code files for evaluating tasks. When you set a job object's `AutoAttachFiles` to true, an analysis determines what files on the client machine are necessary for the evaluation of your job, and those files are automatically attached to the job and sent to the worker machines.

For more information, see Automatic detection and transfer of files required for execution in both batch and interactive workflows in the Parallel Computing Toolbox release notes.

R2012b

Version: 6.1

New Features: Yes

Bug Fixes: Yes

Automatic detection and selection of specific GPUs on a cluster node when multiple GPUs are available on the node

When multiple workers run on a single compute node with multiple GPU devices, the devices are automatically divided up among the workers. If there are more workers than GPU devices on the node, multiple workers share the same GPU device. If you put a GPU device in `'exclusive'` mode, only one worker uses that device. As in previous releases, you can change the device used by any particular worker with the `gpuDevice` function.

Detection of MATLAB Distributed Computing Server clusters that are available for connection from user desktops through Profile Manager

You can let MATLAB discover clusters for you. Use either of the following techniques to discover those clusters which are available for you to use:

- On the **Home** tab in the **Environment** section, click **Parallel > Discover Clusters**.
- In the Cluster Profile Manager, click **Discover Clusters**.

For more information, see Discover Clusters.

Upgrade Parallel Computing Products Together
Compatibility Considerations: Yes

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Compatibility Considerations

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Computing Server together. These products must be the same version to interact properly with each other.

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