

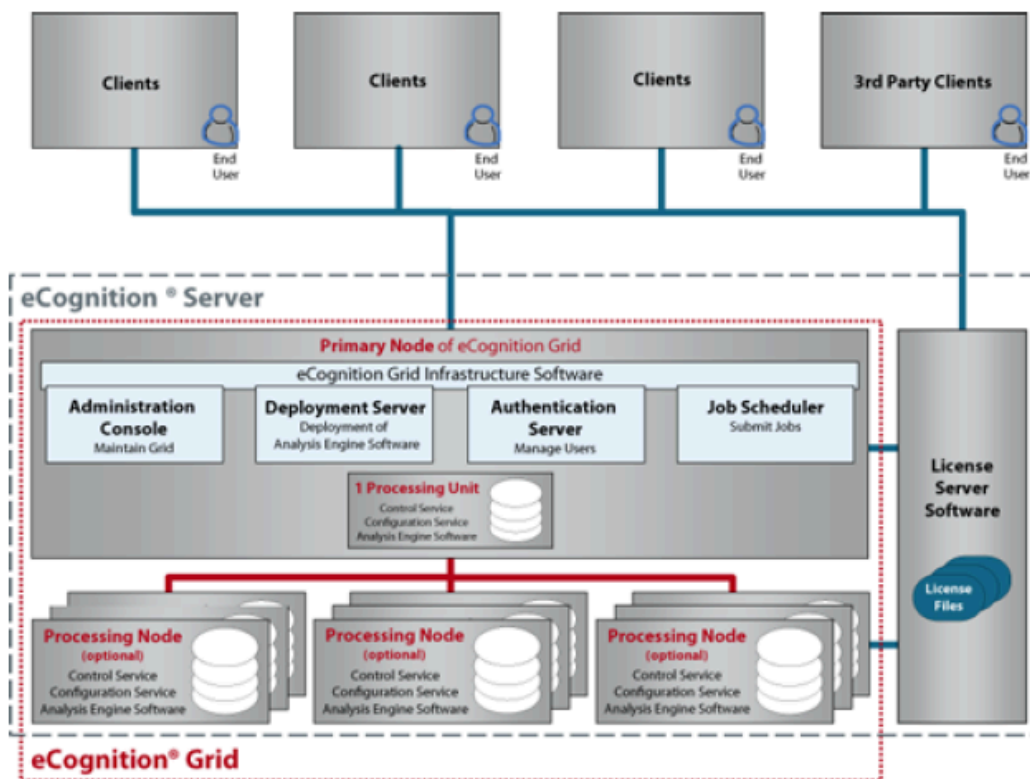
# Controlling the Linux eCognition GRID server v9 from a eCognition Developer client

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V0.1: 07.11.2014 Initial document write up  
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eCognition Grid and Server installation concept.

## Using the ITOS Grid Server for your eCognition project:

With the ITOS eCognition Server you can start processing a Developer project on ITOS instead of using your local PC. Your eCognition project is send to ITOS as a ruleset file and processing is done on multiple cores on this Linux server. Important: the network drive with your eCognition project data must be shared with the same name as described in your eCognition project.

The server setup:

1. License server for eCognition: worldview.ads.uni-jena.de
2. eCognition GRID Server: itos.ads.uni-jena.de
3. Fileserver: worldview.ads.uni-jena.de
4. Client PC: your local PC/Notebook/Mac connected via VPN or directly within the FSUJENA IP number range.  
(Ideally 2. and 3. are the same - should be possible, but not tested yet)

## 1. Copying the workspace and its content to a network drive

Verify that your eC project file, data file, ruleset file or other additional files that are needed for your project to run smoothly are shared on the network drive that can be mounted on ITOS (this works for Rapideye and Worldview network drives). Usually the most straightforward solution is to copy the workspace to the network folder, reopen your project file and modify the data layer links within the project file.

## 2. Mounting the windows network drive on ITOS (this must be done by the ITOS admin):

Root should mount this drive to ITOS exactly the way it is mounted on your windows PC: e.g. if you use your data directory as shown in Figure 1:

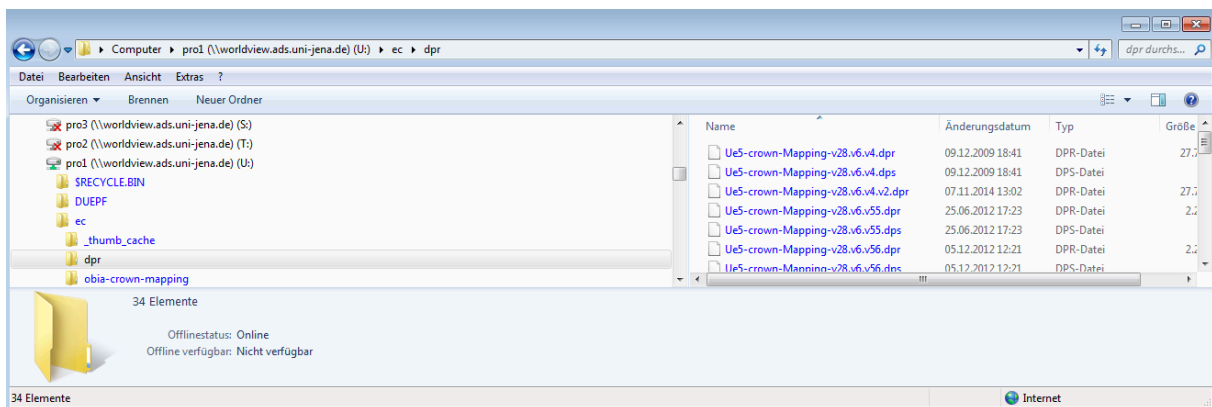


Figure 1: shared directory from worldview.ads.uni-jena.de

On ITOS “root” should mount your windows directory to the following mount point:  
`/mnt/worldview.ads.uni-jena.de/pro1/ec`

The /mnt prefix is automatically removed (for the configuration) by the eCognition Server on ITOS.

If you issue a „df -k“ you should see your windows directory mounted:

```
//worldview.ads.uni-jena.de/pro1/ec 2047999996 1314765456 733234540 65%  
/mnt/worldview.ads.uni-jena.de/pro1/ec
```

Your workspace file is within the “eC” directory in this example and all other files are below that level. In theory it is also possible to use an ITOS directory that is directly shared with your PC. This might also be the better (faster) concept as processing is not done over the network on “Worldview” disc space – processing is directly done on local hard discs. The planned upgrade of ITOSs MD1200 will make it easier to do this.

Within the Developer software make sure that your data link is also pointing to the source directory of the shared network folder or ITOS will not find the data when processing starts.

## 3. Export your Rule set

In order to start the processing job on ITOS you export your ruleset as a dcp-file. Put the dcp file also into the ec workspace area.

## 4. Configure and start the Analyzer:

Within the Developer select “Analysis->Analyze” from the menu or start Analyze from the context menu of the project listing in the workspace view and set the following parameters as shown in Figure 2. Use your dcp file from 3. under „Rule Set“ (or solution file – dax)

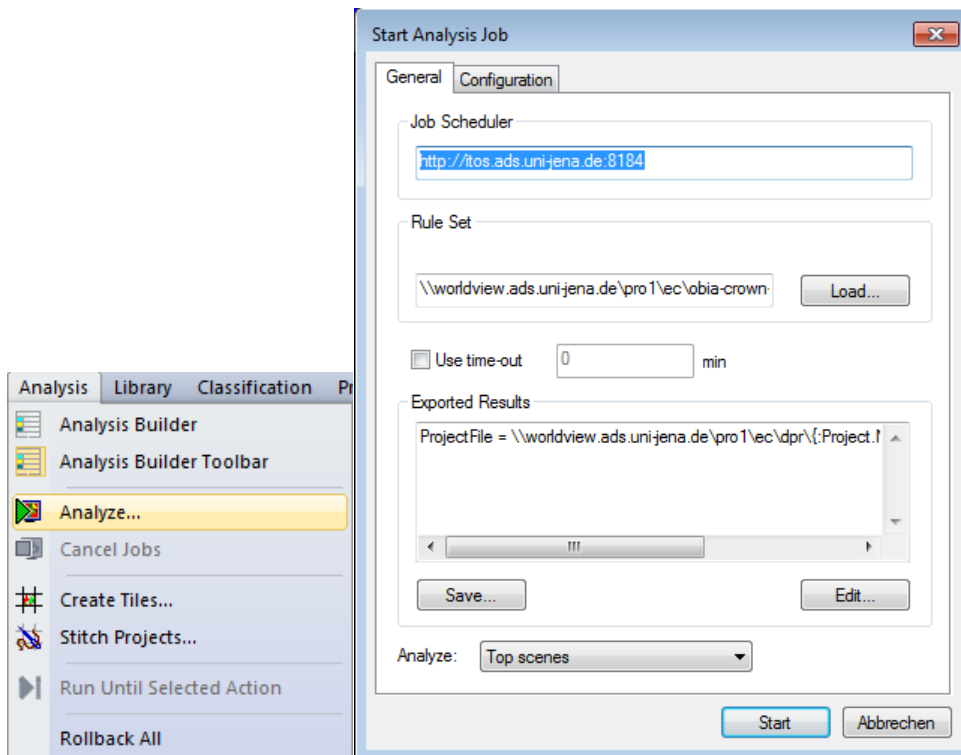


Figure 2: Analyze function in eCognition Developer 9 with itos specified as server and 8184 as the TCP port for the job scheduler.

Make sure that you select the correct dcp file and use the correct naming for the itos server and the correct TCP Port number to access the GRID Service on ITOS (8184).

If your rule set processes will not export additional resulting layers, you will only receive a new processed project file that has to be reimported into your workspace. If you defined export layers within your project file - than ITOS will also generate these layers/files while processing your dcp file (compare with "Exported Results" in Figure 2).

#### 4. Monitor your processes:

If you want to monitor the progress of your processing job on ITOS, you can check the status using the "Job-Scheduler" opening <http://localhost:8184> on ITOS within a web browser (as in Figure 3. Some status information is also available within the workspace view.

#### 5. Re-Import your project files or check the exported results.

Processing is performed over the network. Speed and performance depend on the ITOS CPU load and the network activities on ITOS and on Worldview. So processing speed may vary considerable. VPN access seems to work fine (you can also start the ITOS node from a PC that is connected over VPN with the FSUJENA domain).

The following prerequisites are important:

1. TCP Ports 8184 8284 4002 and SSH must be open on ITOS,
2. mount points have to be identical with your windows setup! (check the setup as it appears with "df- k" on ITOS) and
3. the eCognition "user" on ITOS needs 0777 access to these folders (cifs mount, must be done by root),
4. the Linux init.d daemons for eCognition must have been started (root),
5. a Server license must be available on worldview (5 are licensed)
6. /tmp directory space must be sufficient on ITOS (400Gb)

- shared network data drive space must be sufficient on worldview (suggested are /pro1, /pro2, /pro3 (3-4TB space available)
- Worldview** is the *license server* and should also be used as the *fileserver* for your workspace (/pro1 -/pro3 partitions), **ITOS** is the *processing node*, and your **Windows PC** is sending the processing configuration and acts as the *client*.

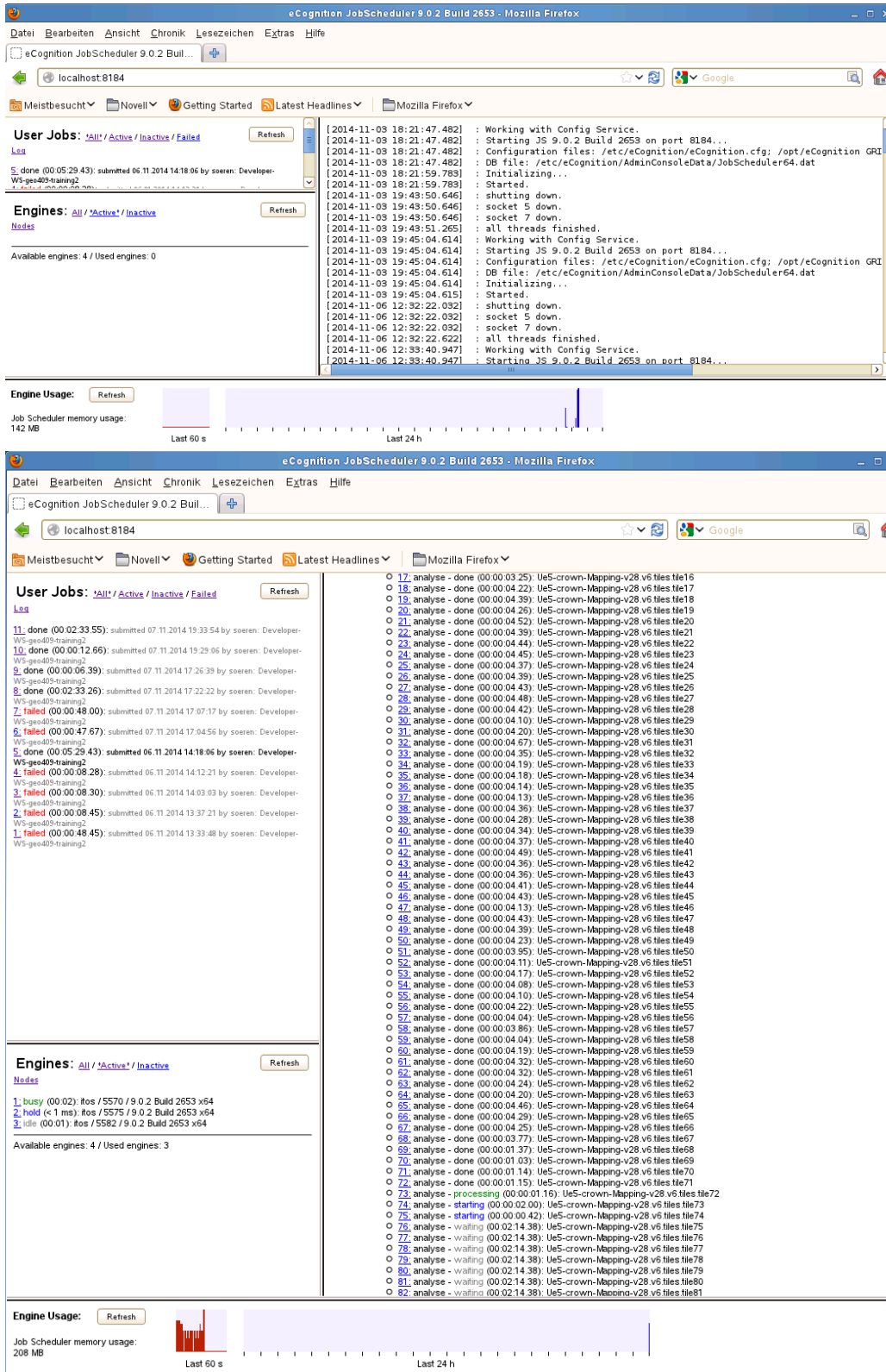


Figure 3: eCognition job scheduler log, engine usage (number of cores in use) and memory usage of the last 24h viewed locally on ITOS. The log also plots error messages that are not visible from the workspace view of the Developer.

The GRID server on ITOS can also control other node installations on PCs or Linux systems, as long as there is a shared network access point to access the workspace files. To form a network of eCognition processing nodes (right now) a maximum of 5 nodes could be combined to work within the GRID (only restricted by the number of server licenses).

### Some potentials and limitations concerning “Multi-Core Processing” on ITOS:

Note however that you cannot use more than one engine (CPU core) within one project/dcp-rule set if you haven’t tiled your data within this project. If you tiled your data into multiple tiles (“Create Scene Tiles Algorithm” within a rule set) than the GRID will scale to all (max) 5 available engines (Figure 4). Scene Tiles also work with 3D data! You can also use multiple engines when more than one project is started/running on the GRID Server. Or you might want to work with different scaled versions of your project and therefore derived “scene copies” with different scale factors or you created different scene subsets (maybe ecological sub regions or different landuse classes) to be processed for sub-classes individually. Multi-Scale Workflows are also very useful if different level of detail is needed in sub regions (full analysis of a large regions in low level of details and selected analysis on subregions/selected objects with high level of detail).

In all these cases you will utilise more than one GRID engine and processing will be much faster. If you plan to use the eCognition server, note that also subroutine programming can be very helpful later because you can use the “Submit Scenes for Analysis” algorithm to individually process created sub-scenes of a project each on one server engine (node). You find sub routines on tabs in the process window (if you created one). Please also check chapter 7.9.8 and 7.10 of the UserGuide.pdf (version eCognition 9.0.2) about working with multiple maps and especially “Workspace Automation” and “workspace automation algorithms” (processes) to become productive! Scene copy/scene subset/scene tiles and stitching concepts are also explained here. Stitching can also be done using the Server by selecting “right-click” on the project within the workspace view or stitching within your rule set.

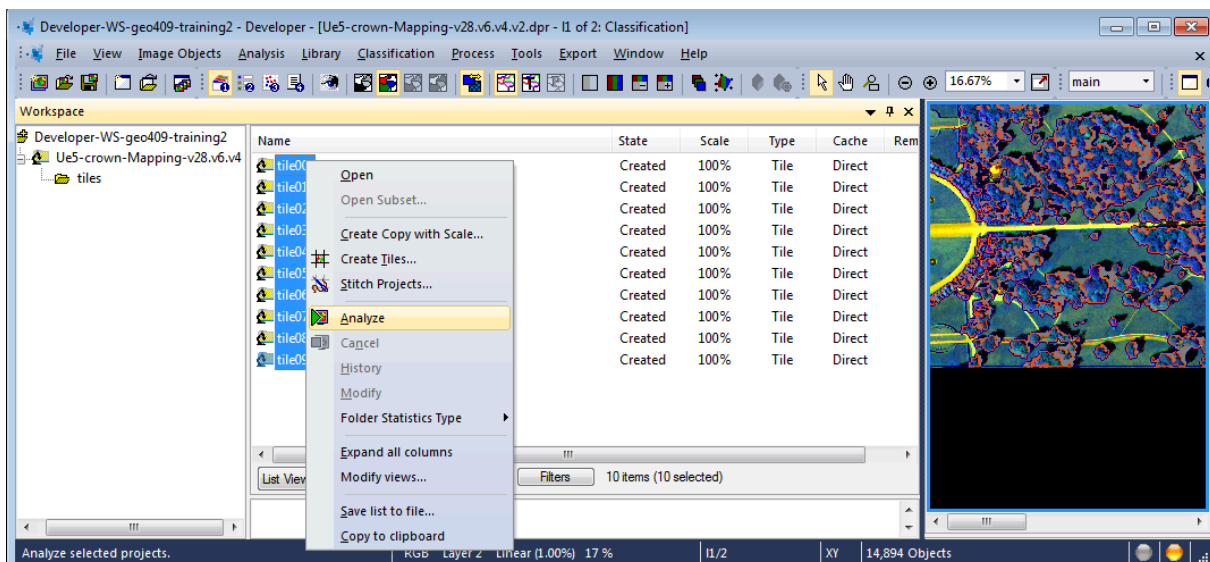


Figure 4: Tile processing from the Workspace menu with the same dcp file setup

The server on ITOS is therefore also especially useful if you plan to work on large areas with large amount of objects (ITOS RAM upgrade now provides 72GB) and when working with multiple tiles within one project or if you split your work into various different projects or project-versions within your workspace environment for testing or large data processing.

**Details for configuration of the GRID on the Linux side** (listed here for documentation purpose only – this is not important for the users working on a client but it's a log for reinstallation):

## 0. install rpm –i

1. Check License configuration:

```
/etc/eCognition/AdminConsoleData/installers/grid_bin/lic/floating.lic  
/opt/eCognition GRID 64 9.0/bin/lic/floating.lic  
#SERVER worldview.ads.uni-jena.de ANY  
#USE_SERVER
```

2. Node / Server configuration front end: (root) <http://localhost:4002> (only changeable when the eCognition service is down – stopped), initial passwd after installation of the server is “admin”, this passwd is changed after installation.

3. Restart services after changing node config.

Services:

```
/etc/init.d/eCognitionControlService stop  
/etc/init.d/eCognitionGRID stop  
/etc/init.d/eCognitionControlService start  
/etc/init.d/eCognitionGRID start
```

4. Check the processing state: <http://localhost:8184>

5. ecognition user cifs mount on ITOS/NOAA: `/sbin/mount.cifs //worldview.ads.uni-jena.de/pro1/ec /mnt/worldview/pro1/ec -ouser=c2heso,pass=XXXXXX,domain=FSUJENA,uid=ecognition,gid=ecognition,file_mode=0777,dir_mode=0777`

6. On the „Developer“ client side: directly use the workspace and project area that is mounted by ITOS. This should be a directory on worldview, The mount command in 5. provides the partition access for ITOS. The Developer client mounts this partition in the same way for Windows.

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