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Understanding Images

Definiens

Definiens XD 2.1

Release Notes

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Definiens Documentation:

Definiens XD 2.1

Release Notes

Imprint

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Dear User,

Thank you for using Definiens software. We appreciate being of service to you with image intelligence solutions. At Definiens we constantly strive to improve our products. We therefore appreciate all comments and suggestions for improvements concerning our software, training, and documentation. Feel free to contact us via web form on the Definiens support website www.definiens.com/support

Thank you.

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Regulatory affairs

Under certain circumstances the solutions and applications developed using Definiens Developer XD may fall under specific regulations (e.g. medical device or IVD regulations) in your country. Please ensure that you check and follow local regulations before using or taking your solution or application into commerce. If you require specific data about Definiens Developer XD, please contact your dealer or our sales staff.

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1 Overview

Definiens XD is a comprehensive image analysis platform for multi-dimensional image analysis. It contains all the client and server software needed to extract intelligence from any digital image in a fully automated or semi-automated way.

1.1 About Definiens XD 2.1

Definiens is delighted to bring version 2.1 of the Definiens XD platform to you. The main goal of this release is making users more productive, accelerating the whole process from digital image to final result. We recommend all customers to update to this new release. Please have a look at the Release Highlights section below for a list of the most important new features, and check the complete list of features and bug fixes for more details.

Definiens XD 2.1 also contains Definiens Tissue Studio® 3.6 which has a similar focus on productivity. Please see Definiens Tissue Studio® 3.6 release notes for additional details of changes in this product.

Customers are advised to review these release notes before upgrading to Definiens XD 2.1.

Please contact support@definiens.com if you have any specific questions regarding this version or the upgrade process.

1.2 Key Features

Definiens XD clients for application developers and end users

- Definiens Developer XD – the powerful development environment for biomedical image analysis
- Definiens Architect XD – the easy-to-use end-user application for running solutions
- Definiens Viewer XD – the free viewer for reviewing and sharing results

Definiens Server XD

A scalable, server-based batch processing environment for multidimensional analysis of biomedical images.

Comprehensive multidimensional data import

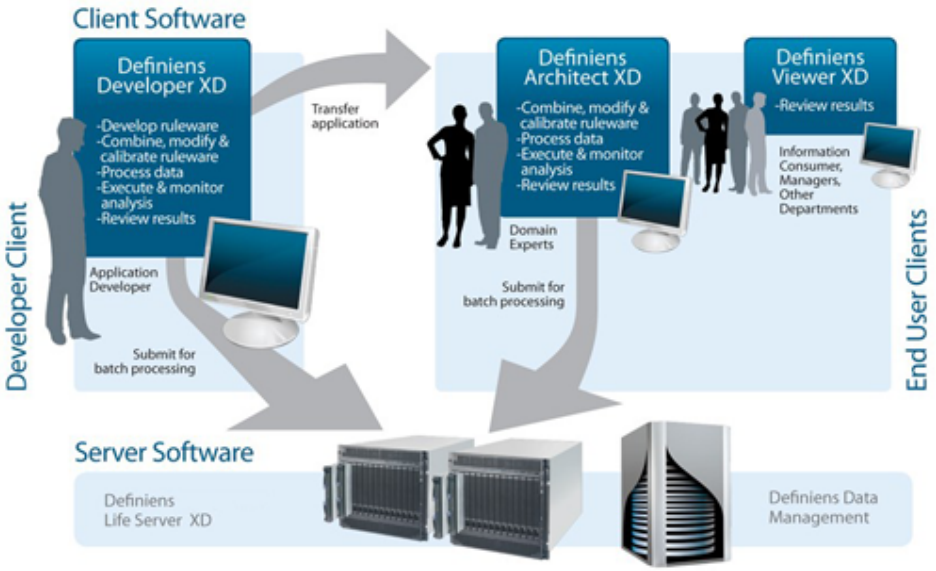

Figure 1.1. Definiens XD multi-dimensional image analysis software

- Generic import builder tool
- Multi-dimensional Data Model
- Support for comprehensive range of multi-dimensional image formats

High-Performance Analysis of Complex Multidimensional Data

- Definiens Cognition Network Technology® for XD
- Object-based pixel processing
- Multimap support and regions to support flexible analysis workflows including multi-magnification, registration and comparison workflows

Full Multidimensional Object Model

- 3D features and algorithms
- Object linking for time series support

Multidimensional Image Viewing

- Multi-planar projections (XY, YZ, ZX)
- Animations of time series data
- Comparison views of multiple images side by side
- Linked object selection and picking
- Independent or synchronized views

Sophisticated 3D Visualization

- Surface rendering of classified objects
- Rotation, zoom, class selection, transparency settings and export
- OpenGL hardware acceleration

Integrated Image Registration

- Rigid and elastic transformations
- Landmark and non-landmark based schemes
- Automated, semi-automated or manual landmark identification

Integration of XD Image Analysis into Existing Workflows or Applications

- Automation API
- Data IO API
- Engine API

1.3 Release Highlights

Fast and efficient whole slide review

- Fast opening of and browsing through whole slide images for quality control and result interpretation

Improved metadata handling

- Improved handling of metadata (patient ID, dosage, etc.), e.g. for visualization, selection of data sets for rule set development and result review

Improved integration with Image Miner

- Smooth integration with Definiens Image Miner® for fast path to final result
  - Direct interaction between products
  - Metadata directly available for data grouping, data visualization and result interpretation

New algorithms

- nFusion for fusion of more than two image objects
- ring filter for detection of ring-like structures

Please note: When using Windows 7 and Windows 2008 the default settings of the Windows firewall may prevent successful installation and usage. Please see the knowledge base article[1] for detailed information and an example script to update firewall configuration.

1. https://definiens.zendesk.com/entries/225149-windows-2008-and-windows-7-firewall-configuration

2 Features, Bug Fixes and Limitations

See table 2.1 on this page, *New features in Definiens XD 2.1*.

2.1 New Features

Table 2.1. New features in Definiens XD 2.1

Category	Reference	Description
Data I/O	20409–20414	Import of metadata based on csv files
Data I/O	20170	Support for Nikon Elements .nd2 file format
Data I/O	19866	Aperio Spectrum: Aperio FL images are imported without metadata
User Interface	20445	Workspace Window: Added option to reset single projects and delete all results from this project.
User Interface	20620	Workspace Window: Visualization of csv-based imported metadata
User Interface	20431	Image Layer Mixing: Fast histogram calculation (approximation) for large images
User Interface	20179	Whole Slide Review mode: Allow fast visualization of whole slide image result based on new result container export algorithm
User Interface	20382	Add option to open current workspace in Image Miner (File menu)
Algorithm	20264	New algorithm: Export to result container
Algorithm	20577	New algorithm: nFusion
Algorithm	20577	New algorithm: ring filter

Continues...

Category	Reference	Description
Algorithm	20407	Create links: extension to support links between images with transformations (e.g. rotation, affine), and link by intensity
Features	20577	New feature: Scene/image file name
Features	20464	New feature: histogram maximum
Analysis Builder	19454	New Condition widget allows combination of multiple conditions
Job Scheduler	20175	Allow user to define how long failed jobs should be kept in history of Job Scheduler
Job Scheduler	20014	Introduce option for keeping Job Scheduler data base in memory

2.2 Bug Fixes

See table 2.2 on the current page, *Bugs Fixed in Definiens XD 2.1*.

Table 2.2. Bugs Fixed in Definiens XD 2.1

Category	Reference	Description
Data I/O	20501	Leica SCN: Files created from Ariol cannot be loaded
Data I/O	19938	Olympus: Crash when importing images with Z stack
Data I/O	19887	Leica LIF files are imported wrongly using Generic import template
Data I/O	20017	OMETIFF: Import does not work correctly for 64 bit version
Algorithms	19983	Export Current View: Scale bar is not shown in exported images
Algorithms	20289	Stain Isolation: Processing hangs.
User Interface	20524	Save and restore current project state buttons do not restore image layers
User Interface	20962	3D toolbar window layout selection: Icons don't match with functionality
Installation	20312	Developer XD not starting and crash to Desktop due to IPP conflict
Job Scheduler	20016	DIAJobScheduler.log error messages related to JobSchedulerUsers.xml

Continues...

Category	Reference	Description

2.3 Known Issues and Limitations

Switching OS User Accounts Without Stopping Local Engines If a user switches users with engines already started, these engines may not be available to other users. When switching users it is necessary to stop the engines first to avoid this problem.

Maximum 10,000 Thumbnails Created for a Workspace The maximum number of thumbnails that will be created for a workspace is 10,000. Workspaces with greater than 10,000 images are supported, but only 10,000 thumbnails will be created.

Migration of Image Proxy Server Cache Created with XD for Large Images A bug has been corrected with the Image Proxy Server (IPS) 1.5 that affects the image statistics calculation for large images. In XD 1.5 this may have resulted in different results when comparing the analysis of images, with and without the IPS. The new version of the IPS will create the correct image statistics. This affects images with a size > 2^32–1 bytes .

Any existing cache created by the IPS for these images (1.5) will have the old incorrect image statistics and therefore may produce different results. If you wish to re-analyze existing cached slides and produce the new (corrected) results, it will be necessary to remove the previous slides from the cache. Please contact support@definiens.com for specific advice regarding this topic.

Red Hat Enterprise Linux 5 64-bit – libungif Package Dependency for 32-bit Edition Users who install the 32-bit server edition (or 32-bit package) on Red Hat 5 x64 should note that libungif is a required package.

Post-processing on TMA workspaces Users who would like to apply a post-processing rule set to TMA cores should submit the individual cores for post-processing. Post-processing will fail if the whole slide is submitted. In this case the post processing will analyze the cores ignoring the existing results.

2.4 Errata

None

3 Additional Information

For additional information please contact support@definiens.com

3.1 Upgrading to Definiens XD 2.1 from Previous Versions of XD

Upgrading Definiens Client Products

You may choose to install updated versions of the client software alongside previous versions. This includes both 32-bit and 64-bit editions. If you wish to install multiple XD clients, please ensure you set the local server service to start manually. This will allow you, if you are using the local server, to control which version of the local server you are using.

Upgrading Definiens Server XD

You are recommended to update your GRID to XD 2.1, as there are some optimizations to the Job Scheduler and the Administration Console. You are required to update your GRID if you wish to deploy Definiens Image Miner® Server on your existing GRID.

Please ensure that you make backups of any required data files prior to upgrading.

- jobscheduler.dat (job history)
- Admin Console Database (GRID setup and configuration – in folder AdminConsoleData)
- Any modified configuration files with custom settings (advanced)

Please note, previous installations should be removed, as installing multiple versions of the GRID on the same computer will cause processing problems. You may also not install 32-bit and 64-bit Definiens Server XD side-by-side, however you may upload both 32-bit and 64-bit packages to your server.

For a full discussion of interoperability between 32-bit and 64-bit editions please see FAQ – Definiens XD 2.0 64-bit.

3.2 Further Information

For detailed information regarding the new capabilities of Definiens XD products, please refer to the respective user guides.

As with all updates, please consult the System Requirements documentation. Users wishing to take advantage of 64-bit editions may wish to upgrade the available memory for clients and servers.

Acknowledgments

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