

Root directories

In order for PMA.core to show content, you need to set up root directories. A root directory is a starting location from which your various whole slide images will be hosted.

The reason for working with root directories offers several advantages:

- You don't have to navigate through a complicated directory structure before reaching the files that you want to work with
- You can map multiple root directories to organize slides according to different purposes or workflows.
- Switch out different types of storage without the end-user knowing about it. When you move data from a conventional hard disk to cloud, you typically need to install a new piece of software (S3 browser, or an FTP explorer). With PMA.core, you just re-direct the root-directory to point to the updated location and you're done; the end-user remains unaffected

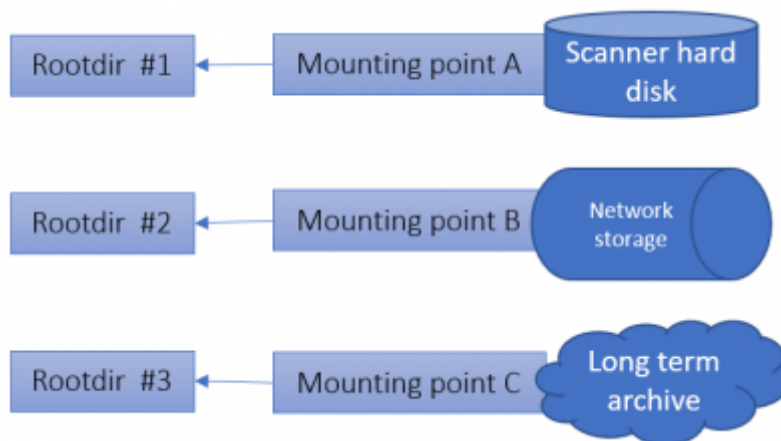


The concept of root directories is not dissimilar to mapped network drives in the Microsoft Windows operating system, where you map a map such as `\\myserver\dir\subdir\subsubdir\` to a (much simpler to remember and address) drive letter.

Mounting points

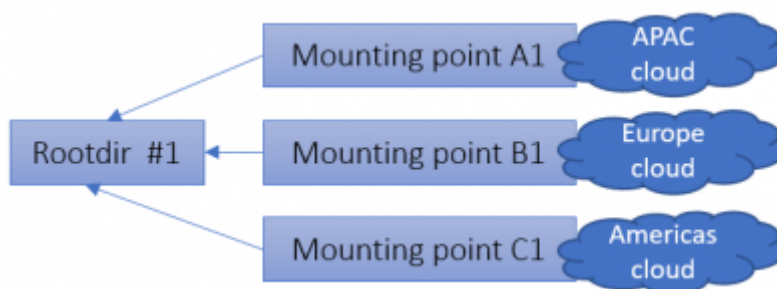
Since PMA.core 2, a root directory is defined by one or more mounting point. This was done to be able to facilitate [geo-replication scenarios](#).

A mouning point for a root directory may either be a local directory, a UNC share, Azure blob storage, FTP folder, or an Amazon S3 compatible storage.



A Mounting point is a further abstraction of the concept “where are my slides stored?”. While most users will end up having one mounting point per any one root directory, here are the different scenarios in which you could have multiple mounting points:

- [Geo replication](#)
- Automatic failover between different storage types. If a network resource is not available, a fallback could be offered to an alternative location (possibly with a reduced or older dataset)



In order to make root directories work, you need to attach at least one mounting point to it.

The mounting point of a root directory refers to the base directories where the system should look into for whole slide images. All the subdirectories of the root directories are exposed by the application and whole slide images that are discovered are advertised.

Root directories				
Home > Root directories				
Root directories Add				
Path	Alias	Offline	Path Exists	
E:\storagesesi	Local slides	☐	☒	Edit Delete
\\NAS\shared\esi	Shared slides	☐	☒	Edit Delete

Configuration

We have a [separate section](#) in this wiki that takes you through the different steps that you can take to [configure root directories and mounting points](#).

Root-directories can be labeled public or private, which allow you to [take security precautions when configuring these](#).

Security

Root directories can be either [public or private](#).

Who's accessed what (either public or private) folder can be monitored via the Access log tab.

User 'Reference' Log

Summary	Edit	Mounting Points	Audit trail	Activity log	View slides
Root directory Access Log					
Time	Slide Name	User			
07/02/2022 12:22:56	CMU-1.mxs	PMA_UI_demo			
07/02/2022 10:32:33	CMU-2.mxs	PMA_UI_demo			
07/02/2022 10:32:33	CMU-1.mxs	PMA_UI_demo			
07/02/2022 09:34:29	CMU-1.mxs	PMA_UI_demo			

Logging

Apart from manipulating root directories, monitoring their use is an important aspect of our software as well.

You can monitor logs for several kinds of activity:

PATHOMATION PMA core v2.1.0 2031 ©2022 Pathomation

Root directory details

Home > Root directories > Details

Summary Edit Mounting Points Audit trail Activity log

Alias P0012 Path

Offline ☐ Endpoint system name

Description Partial mirror of \histosrv data for demo Chunk size

Is directory indexed Indexed Service url

Log files Elmah logs

Audit trail

The audit trail tab combines any operations that were performed on both root directory entries and underlying mounting point entries.

Audit trail for P0012

Home > Root directory > Audit trail

SummaryEditMounting PointsAudit trailActivity logView slides

Audit trail

EventId	Event	EventType	EventDate	EventLog	EventRef	AltRef	Description	W	Offline	Public	Score
0	41736	Success	2/13/2022 12:38:28 PM	pma_admin	84.196.261.309	P0012	Partial access of necessary data for slide	21	False	False	0

Showing 1 to 1 of 1 entries

Mounting points audit trail

EventId	Event	EventType	EventDate	EventLog	EventRef	AccessRef	ClientRef	Endpoint/Interface	InstanceID	Path	RootDirectoryID
0	20833	Success	11/02/2021 2:56:42 PM	N/A	N/A	Access to necessary data for slide	8385660	api.central.5	1	p0012vub	21
0	8171	Success	10/19/2021 10:10:59 AM	N/A	N/A	Access to necessary data for slide	8385660	api.central.5	1	p0012vub	21
0	13115	Success	11/02/2021 1:45:37 PM	yviss	81.82.195.9	N/A	N/A	N/A	N/A	N/A	N/A

The presented information [21 CFR part 11 compliant](#).

Activity log

In addition to an audit trail, an activity log is available that chronologically tell you which user has been accessing what slides in the root directory:

User 'P0012' Log

SummaryEditMounting PointsAudit trailActivity logView slides

Root directory Access Log

Time	Slide Name	User
10/02/2022 11:30:00	11.10. Placenta à terme (104).svs	wordpress
10/02/2022 11:29:58	11.9. Placenta bij 7 - 8 weken zwangerschap (105).svs	wordpress
10/02/2022 11:29:56	11.8. Endometrium gravidaris (87).mxs	wordpress
10/02/2022 11:29:54	11.7. Endometrium dag 25 (85).mxs	wordpress
10/02/2022 11:29:52	11.6. Endometrium dag 17 (84).svs	wordpress
10/02/2022 11:29:50	11.5. Endometrium dag 10 (83).mxs	wordpress
10/02/2022 11:29:48	11.4. Ovarium (kutsaaf) (82).mxs	wordpress

Elmah log

[Elmah error logs](#) are a standard way of capturing runtime errors in software. While these logs are not specific to root directories, they can help troubleshoot intermittent problems. Examples include:

- connection information is (temporarily) no longer correct
- a file format may have been modified by its vendor and now no longer renders correctly

HomeUsersImagesFormsSettingsDiagnosticsInstallation CheckPerformanceLog FileElmah LogSetup Import

Error log for /M/WISVC/ROOT

host.pathomation.com/pma.core/2/vulnh

Error Log for pma.core.2 on ASTRA4022

100 hits | 100 errors | Download Log | Help | Refresh

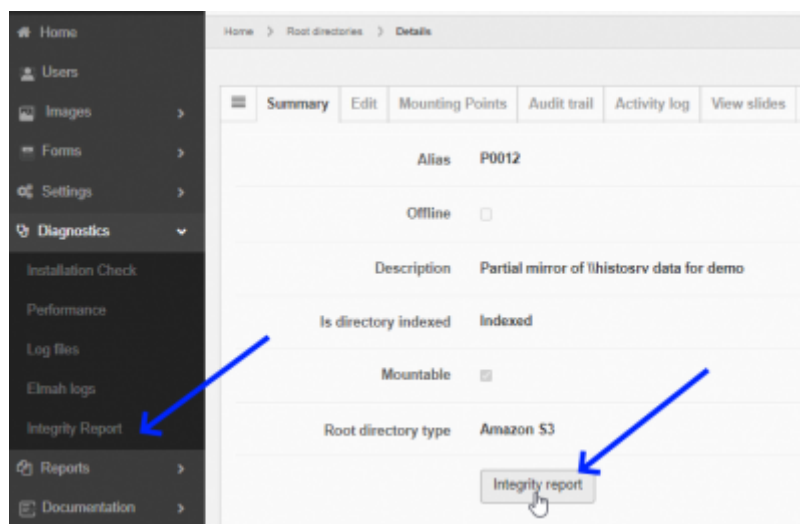
Errors 1 to 15 of total 5472 (page 1 of 365). Start with 10, 20, 30, 40, 50 or 100 errors per page.

Event	Code	Page	Error	Host	Date	Time
ASTRA4022	0	Web	WebResourceException: Log on failure		2/13/2022	6:14 AM
ASTRA4022	0	Web	WebResourceException: Log on failure		2/16/2022	6:16 AM
ASTRA4022	0	Web	WebResourceException: Log on failure		2/16/2022	12:28 AM
ASTRA4022	0	Web	WebResourceException: Log on failure		2/16/2022	6:14 AM
ASTRA4022	0	Web	The remote server returned an error (403): Forbidden.		2/8/2022	7:48 AM
ASTRA4022	0	Web	The remote server returned an error (403): Forbidden.		2/8/2022	7:48 AM
ASTRA4022	0	Web	The remote server returned an error (403): Forbidden.		2/8/2022	6:08 AM
ASTRA4022	0	Web	The remote server returned an error (403): Forbidden.		2/8/2022	6:08 AM
ASTRA4022	0	Web	The remote server returned an error (403): Forbidden.		2/8/2022	6:08 AM

Integrity check

Elmah logs work great for ad-hoc troubleshooting, but when problems persist over time, a more structured and proactive approach is warranted.

When you suspect certain slides in a particular root directory are corrupt, you can run an integrity check on a particular folder:



This attempts to read all slides in a folder and reports on the ones that fail. You should then [try to find out why such slides cannot be read](#).

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<https://docs.pathomation.com/pma.core/2.0.0/> - **PMA.core 2.x**

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