SOLIDWORKS PDM

DISASTER RECOVERY

SOLIDWORKS PDM 'DISASTER RECOVERY' PLANNING AND EXECUTION

Over the last few weeks and months, we have seen a major uplift in the calls coming into the helpdesk asking for our advice and assistance after a customer suffered a cyber-attack that has corrupted all, or part, of a PDM implementation. The purpose of this mailer is to help your PDM Administrator or IT Professionals understand the steps involved in preparing for and then executing a Disaster Recovery, should you need to rebuild a copy of a PDM vault after your SOLIDWORKS PDM infrastructure becomes inoperable, inaccessible, or damaged as the result of unplanned disasters. This same process could also be used to create a duplicate system to recover individual or small groups of files after an accidental removal from the Vault (destroyed not deleted).

Before starting a recovery, you should make certain that the extent of the infection doesn't also include your Backup Server(s) or that the infection didn't occur before the last backup took place. For this reason, offsite backups (tape or cloud) should also form part of your backup strategy.

WHAT TO EXPECT FROM A DISASTER RECOVERY

Restoring a Vault from backup will revert the content of the Vault to the state it was in at the time that backup was created. Based on the fact that the recovered Vault will only be as good as the last backup, this has a number of key observations.

- Any changed data, not checked-in, will be excluded from the backup/recovered Vault

- Any new data, that has **never** been checked-in, will be excluded from the backup/recovered Vault

- Any data created or modified **after** the last backup will be excluded from the recovered Vault

As there are a number of key backups required to complete the recovery process it is therefore very important, from an integrity point of view, to ensure that these backup(s) are created as close as possible to each other.

Most customers will be creating a single 'daily' backup during 'downtime' meaning that after a Disaster Recovery they could have lost a maximum of one day's worth of data. To reduce the amount of data that you would risk losing, you could consider running the backup(s) more frequently, but this is only effective if new and changed data is being checked-in throughout the day.

NOTE: The use of Overwrite Latest Version during a check in can reduce the number of file versions being created in the Archive with more frequent check in's.

It is also worth explaining that PDM doesn't support Transactional Database recovery, so this would mean creating multiple full SQL backups throughout the day with a Differential Backup of the Archive in parallel to this. A full daily backup should still be archived to a safe location each day.

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If you are reading this as a result of a disaster and are already missing the Archive Server Settings, or the ConsisioMasterDB Backup there is still the possibility of a recovery, however you will need assistance from Technical Support in the supply of an 'application' that can rebuild the missing Archive Server Registry keys from the Vault database itself.

DISASTER RECOVERY CHECKLIST

What follows is a high-level overview of what you need to be doing now and what information you may need to have documented to ensure you can complete a full Disaster Recovery.

DOCUMENT YOUR INSTALLATION

SOLIDWORKS PDM comprises a number of discreet components and services that communicate with each other in a fully functional Vault. A typical installation would probably have all these services/file paths etc. on a single server. However, it may be that your setup is distributed over multiple servers. This could be for load balancing, because you are working in a Wide Area (replicated) Network or because you have a Web server that is exposed to the internet. It is important therefore to know what services/software/ paths are in use so you know what specifically you are recovering in the case of a hardware failure affecting one or more of those components.
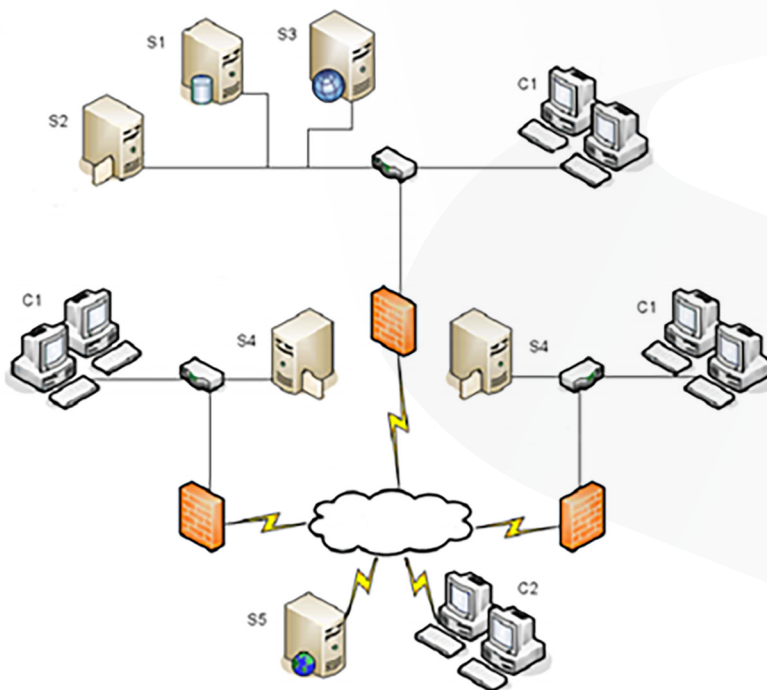

Figure 1: Installation overview within WAN plus Web

S1	SQL and Database Servers	S5	Web Server
S2	Primary Archive Server	C1	Clients
S3	SNL (License) Server	C2	Web Clients
S4	Archive Server with Replicated File Vault		

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UNDERSTAND AND CONFIRM YOUR BACKUP STRATEGY

This is so that you know what is being backed up, where it is being backed up to, and how often. Dependent on your IT tools/infrastructure etc. you may find that a 'backup' of the PDM database cannot be carried out whilst it has connections to it. For PDM Professional (with SQL Standard or Enterprise) we can use the SQL Agent to trigger a Maintenance Plan that can included full backups of the database(s) to the 'backup' location specified during the installation (or another location you define when creating the Maintenance Plan). With PDM Standard (using SQL Express) there is no Agent so we need to script the backup process to be triggered via Windows Task Scheduler. Although now standard in our implementation packages, dependent on when your PDM was implemented (and by whom) this may/may not have been configured for you. In both cases (STD and PRO) the .bak database files should also be backed up **away** from the server to ensure that a backup will be available after hardware failure.

When backing up the vault, the latest updates in files that are still checked out and modified on client workstations are not included, since they are only stored in the local file vault view (cache) of the client. To ensure that the latest information of all files is always included in a backup, the files should be checked in.

A complete file vault backup must include backing up the file vault database and the physical file vault archive files. The database backup must be performed at the same time as the archive file backup to avoid any data loss from mismatched backup sets. Without both the database and archives it is not possible to recover the vault in case of failure.

- **Archive Server Settings -** (created via Archive Server Configuration Tool) The archive server contains file vault settings such as passwords and defined login types. It is also the physical location of the SOLIDWORKS PDM vault files. Backing up the archive server settings does not backup the files, just the settings. Although it can be scheduled, this backup only needs to be refreshed whenever a change is made to the Archive Server Configuration (e.g. create a new Vault, change paths, change user log in types, create new PDM users, change security settings etc.). If you set a password for the backup file when you create it, be sure to document it somewhere safe.

- **Conisio Master Database/Vault Database(s) -** Your Vault database should be in Simple Recovery mode and the daily backup a 'Full', verified, backup. If you implement compression on that backup you should confirm that you can 'restore' that backup. Compression will take less space, but introduces a small risk of corruption. You should also make sure that your Maintenance Plan contains some database health activities such as re-organising and recreating the indexes, rebuilding statistics etc.

- **Archive Server (Data) -** this is the file storage area for **all** the files within the Vault. If you are unsure where the archives are located, check this registry key: HKEY_LOCAL_MACHINE\SOFTWARE\ SOLIDWORKS\Applications\PDMWorks Enterprise\ArchiveServer\Vaults\vaultname\ ArchiveTable

You can also find this path in the Archive Server Configuration Tool. Right click over you Vault name and choose Relocate.

This will display the current path.

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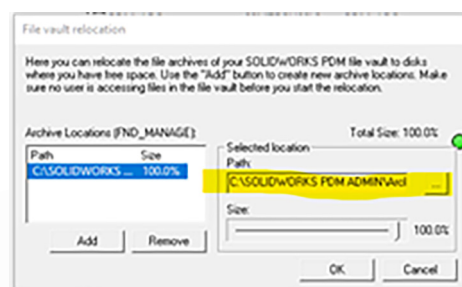
ENSURE YOUR PASSWORDS ARE DOCUMENTED AND VERIFIED

● **SQL Server**

» SQL Server would have been (by default) installed in Mixed Mode Authentication. This means that you will generally have a built in System Account (sa) and normally a Windows User (Local Administrator) or Group of Users (Domain Admins) also classified as a System Administrators who can create/restore backups etc. It is important that you configure the 'sa' user in SQL to not be subject to typical password rules that would mean having to change the password periodically. You should document your sa password and also note which Windows accounts are sys admins in case the sa password does get lost and the user locked out.

If you do not install the replacement SQL Server using the same 'sa' password then certain PDM functions may not work until the new password is applied at the application level (e.g. SQL Lists or Custom Add-ins that communicate with the database etc.).

● **PDM (Admin)**

» When PDM was installed, a 'master' Admin password would have been created. It is possible to override this, however for each Vault created within the Archive Server, please document your Admin user's password and verify that it is valid in each Vault (where multiple Vaults exist).

● **Web 2.0 Service Account**

» If you are running the Web2.0 Web server with PDM Professional then the 'Application Pool' will have been configured to run as a specified Windows User Account that has accessed the Vault View on the Web server and is a member of specific 'Groups' on the server. This account should be persistent and have a static password. You should document the details of the user and password as this information is also required after **EVERY** upgrade applied to the Web server.

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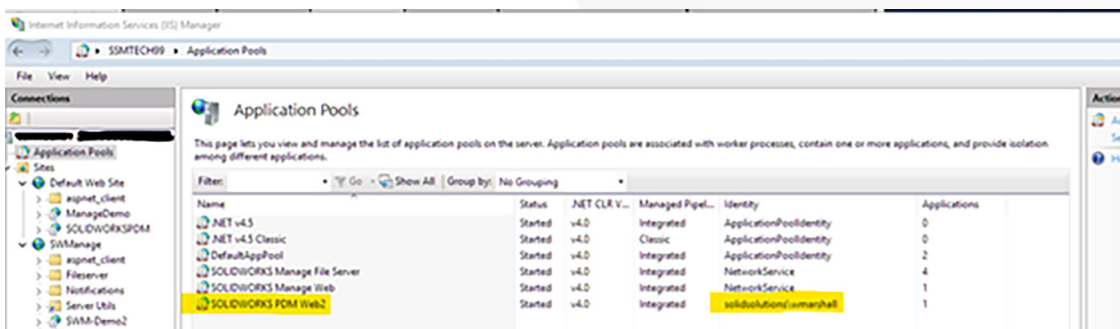
INSTALLATION MEDIA.

Make sure you have a backup of the current (as installed) installation. To ensure a speedy recovery you will want to have the installation media available directly. This will include the:

- SQL Server (Express or Standard, with Management Studio (tools))
  - » For PDM 2020 if using SQL 2014 then you would also require the SP3 installer.
- PDM is installed from the SOLIDWORKS Installation Manager. You should retain a 'complete download' of the version installed whenever you apply an update.

DOCUMENT EXTERNAL LINKS

These are paths or interfaces that may need to be repaired with the introduction of new hardware.

- SQL lists in PDM Professional
- Export/Import rules
- Tasks pushing data outside the Vault

COLD STORAGE

If implemented and set to copy older versions to a folder outside the archive, but also on the Archive Server, ensure you include this path in your backup strategy and document the location.

MESSAGE SYSTEM

If using SMTP (PDM Professional only), be sure to document the settings (server name and authentication method, passwords etc.)

This will be stored and recovered within the database backup, however if your PDM server is also your email server then this may need reconfiguring post-recovery.

ADD-INS

If your PDM Professional Vault contains any bespoke customisation (add-ins). Ensure the deliverables (.dlls etc) are backed up externally to your Vault and that you have recorded any configuration options that are required for their execution. The standard csProjectNumbering add-in for example may contain SQL connection information that would need to be repaired after a recovery/relocation to new hardware.

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IMPLEMENTING THE RECOVERY PROCESS

Restoring a file vault requires recent backups of the file vault databases, ConisioMasterDb database, archive server configuration settings, and file vault archive files. If the compromised hardware was also hosting your License Manager then you will also need to have your Network Serial Number(s) and you will need to contact the Support Team to have them remotely disable the old activation – where you cannot access the License Administrator to complete this task yourselves.

Below are the high level steps required to restore your file vault completely from backups. Detailed instructions are available within the installation guide for SOLIDWORKS PDM (page 149 onwards discusses restoring a backup to the same hardware. When using new hardware you also need to complete the steps from page 191 onwards that talk about moving PDM to new hardware). The installation guide is available as a PDF here;

https://files.SOLIDWORKS.com/Supportfiles/PDMWorks_Ent_Installation/2020/ English/Installation%20Guide.pdf

If you do not need to recover both database and archives, as your setup was previously distributed, then refer to the steps relevant only to the component that has been relocated.

RESTORE VAULT DATABASES

- Install SQL Server software as per previous hardware.

- Apply latest service pack for installed version.

- Using the SQL Management Studio, restore the Vault database using the same database name as on the original server.

- Repeat for the Conisio Master Database.

RESTORE ARCHIVE SERVER AND FILE VAULT ARCHIVES

- Install SOLIDWORKS PDM components using the correct media for the version of PDM you have backed up.

    » If possible utilise the same 'paths' for the installation, especially for the archive server.

- Install and activate new instance of SolidNetwork License Manager (SNL).

- Restore the physical Vault archives from backup (folders 0-F) to the location specified when re-installing the new archive server.

- Restore the Archive Server Configuration Settings.

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CONFIGURE THE MOVED SQL FILE VAULT DATABASE[1]

In the restored file vault database, update values in tables with the new archive server name in the tables ArchiveServers and SystemInfo.
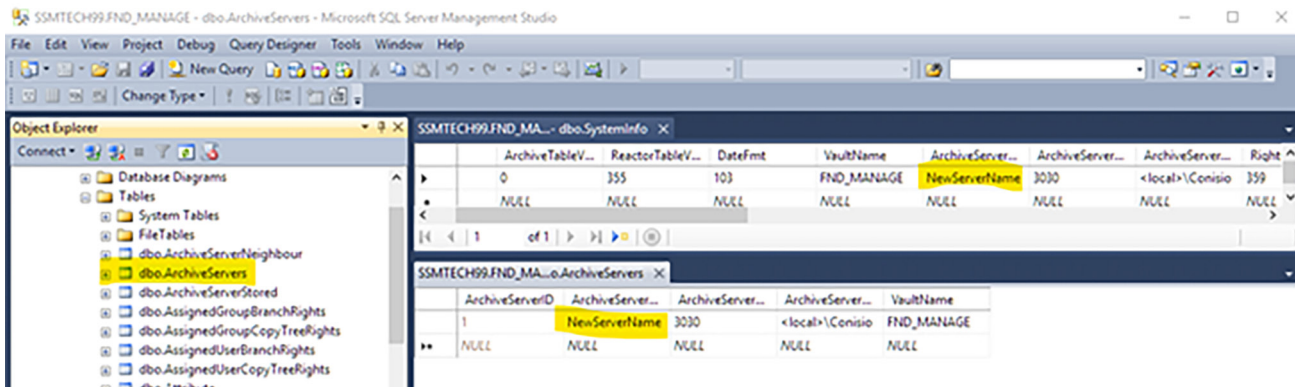
In a replicated environment, the ArchiveServers table contains each replicated server. Be sure to update only the moved server entry. Do not change the VaultName entry.

CONFIGURE THE MOVED ARCHIVE SERVER

If you have not be able to completely replicate the same folder structure on the new server as per the old one, you may need to correct certain paths within the Archive Server Registry.

● Via Start Menu click **Run > Regedit** to open the Registry[2]

● Verify and update if different the following keys:

» **HKEY_LOCAL_MACHINE\SOFTWARE\SOLIDWORKS\Applications\ PDMWorks Enterprise\ArchiveServer\Computers\<Server>[3]\ Archives**

Ensure that the default value points to the correct archive folder (=parent) where the file vault archive is stored (i.e., the path where the backup of file vault archive folder was copied to). For example... C:\ SOLIDWORKS PDM_ADMIN\Data.

» **HKEY_LOCAL_MACHINE\SOFTWARE\SOLIDWORKS\Applications\ PDMWorks Enterprise\ArchiveServer\Vaults\<vaultname>[4]**

Ensure that server value is updated to the new SQL server name and SQLDbName matches the restored file vault database name. Do not change the DbName entry.

» **HKEY_LOCAL_MACHINE\SOFTWARE\SOLIDWORKS\Applications\ PDMWorks Enterprise\ArchiveServer\Vaults\<vaultname>\ ArchiveTable**

Make sure all paths point to the file vault archive location where you copied the files to (from the old server).

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[1]You should only make changes within the SQL database if you are confident and competent that you can do this without compromising the integrity of the database. If you are unsure, we would strongly recommend that you use our services to complete this Disaster Recovery exercise for you.

[2]Registry changes should only be made after a backup of existing keys have been taken, and only by IT personnel who are comfortable and competent to do so.

[3]<Server> should be replaced with your new Archive Server's name

[4]<vaultname> would be replaced with the name of your PDM Vault

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UPDATING CLIENT REGISTRY KEYS (LOCAL VIEW SETTINGS)[5]

The actual location of the following registry keys will depend on how the Vault View was created. If during the View Set Up Wizard you said 'yes' when asked if you were creating the Vault View for **All Users** then the keys are stored under 'LOCAL MACHINE' as below.
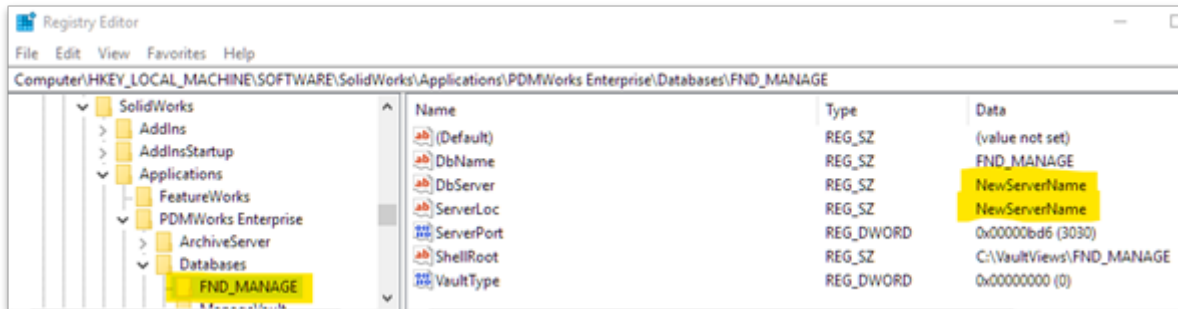
On each client, update the **DbServer** (database server) and **ServerLoc** (archive server) with the new server name(s) in the following registry keys:

- **HKEY_LOCAL_MACHINE\SOFTWARE\SOLIDWORKS\ Applications\PDMWorks Enterprise\ Databases\<vaultname>**

- **HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\ SOLIDWORKS\Applications\PDMWorks Enterprise\ Databases\<vaultname>**

NOTE: If you selected No to creating the View for All Users then the keys will instead be stored under the 'CURRENT USER' hive for the logged in user.

- **HKEY_CURRENT_USER\Software\SOLIDWORKS\ Applications\PDMWorks Enterprise\ Databases\<vaultname>**

- **HKEY_CURRENT_USER\Software\Wow6432Node\ SOLIDWORKS\Applications\PDMWorks Enterprise\ Databases\<vaultname>**

If you also run the Administration Tool on the user's PC you should also delete the following registry key which contains the list of servers displayed in the Admin Tool. This will be rebuilt automatically when next launched:

HKEY_CURRENT_USER\Software\SOLIDWORKS\Applications\ PDMWorks Enterprise\ConisioAdmin

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[5]The keys illustrated below relate to File Vaults created for 'All Users'. If the key does not appear at this location then the Vault View was most likely only created for the logged on user and would instead be found in the HKEY_CURRENT_USER hive, following the same relative path.

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UPDATING WEB 2.0

In most typical set ups the PDM web server application will not be running on the same hardware as your PDM server. In this case you will only need to fix up the client Vault View registry keys as per the previous section and if also re-installing the software/application pool, ensure that the application pool identity has been configured as per the details previously captured.

If installing/configuring Web 2.0 from scratch please refer to Installation Guide or contact Solid Solutions' Professional Services Team who could install/configure this as a service.

UPDATING REPLICATION SETTINGS
(PDM PROFESSIONAL ONLY)

If the recovered Vault is part of a replicated environment, you will need to update the replication settings to reflect the new archive server name.

● From an updated client, open the Administration tool and log in to the vault.

● Right-click Replication Settings and click Open.

● In the Replication Settings dialog box, under Connections, select the first row.

● Under Selected connection, for IP address or DNS name, type the new IP address or name of the recovered archive server.

● Restart the archive server service on each archive server that is replicating the file vault.

FIREWALL RULES

Verify that existing firewall rules (1433, 1434, 3030, 25734, 25735) have been recreated on the new server as applicable for your environment.

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OTHER CONSIDERATIONS – ADMINISTRATION TOOL

- **From SQL Database type list:** (Pro only) For each list, open the List dialog box and update the server details.

- **Message System:** If using SMTP verify that the server details are correct.

- **Cold Storage Schema:** If using, verify the **'move archive files to folder'** settings are still valid for each defined schema.

- **Indexing:** (Pro only) Where used, double click **Indexing**, if enabled, clear the checkbox and then re-enable and configure. (Page 137 in installation guide)

- **Data Import/Export:** (Pro only) For any rules defined in your Vault verify that paths are still valid.

- **Tasks:** For each configured Task, update the execution method and output paths if required.

- **Custom Add-ins:** (Pro only) Update paths or credentials required to execute any custom add-ins.

- **License:** Double click **License**, remove the legacy SNL server and add the new server details.

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