Wolters Kluwer
When you have to be right

CCH® ProSystem *fx*® Workpaper Manager

Deployment Planning Guide

2020

© 2020 CCH Incorporated and its affiliates and licensors. All rights reserved. Material in this publication may not be reproduced or transmitted, in any form or by any means, without prior written permission. Requests for that permission should be directed to:

CCH Incorporated

20101 Hamilton Ave., Suite 200

Torrance, CA 90502

The contents of this publication are believed to be accurate. However, responsibility cannot be assumed for the information contained herein, and the consequences resulting from the use thereof. Material in this publication is subject to change without notice.

This User Manual and the computer software it describes are designed to provide accurate and authoritative information in regard to the subject matter covered. They are distributed with the understanding that the publisher is not engaged in rendering accounting, legal, or other professional service. If legal advice or other expert assistance is required, the services of a competent professional should be sought.

“CCH ProSystem *fx*” is a registered trademark of CCH Incorporated.

“Windows” is a registered trademark of Microsoft Corporation.

All other brand, product, or company names are trademarks or registered trademarks of their respective owners.

Contents

Chapter 1: Deployment Planning - Configuration 1

Introduction 1

Scenario 1: Multi-Site Firm, WM Workstations, Distributed Office Servers 3

Scenario 2: Multi-Site Firm, WM Workstations, Centralized Office Servers 4

Scenario 3: Multi-Site Firm, WM via Terminal Services, Centralized Office Servers 5

Scenario 4: Multi-Site Firm, Terminal Services, and Local PCs 6

Scenario 5: Single-Site Firm, WM Workstations 7

Scenario 6: Single-Site Firm, WM via Terminal Services 8

Scenario 7: Single-Site Firm, Terminal Services, and Local PCs 9

Other Scenarios 9

Summary of Deployment Scenario Recommendations 10

Chapter 2: Deployment Planning - Servers 11

Overview 11

Database Server Overview 11

High Availability and SQL Clustering 11

Microsoft® SQL Express® vs. Microsoft® SQL Server® Standard or Enterprise 12

Microsoft® SQL Server® (x86) with Address Windowing Extensions (AWE) vs. Microsoft® SQL Server®(x64) 12

File Servers Overview 12

Using a SAN 12

SQL 12

Physical Files 13

Microsoft® Windows Server® 13

Hardware Considerations 13

Firm IT Staff Roles and Responsibilities 13

Virtualization 14

Upgrading CCH ProSystem fx Workpaper Manager 14

CCH ProSystem fx Workpaper Manager Office Server Recommendations 15

Terminal Servers 16

CCH ProSystem fx Workpaper Manager Terminal Services Client Overview 16

Terminal Services Client Recommendations 16

Terminal Services Database Overview 17

Terminal Services Database Recommendations 18

Contents

Summary 19

Chapter 3: Deployment Planning - Workstations 20

Microsoft® Windows® 20

Microsoft® Office 20

Microsoft® SQL Server® 21

Hardware Considerations 21

Installation 21

Active Directory® Push 22

Security 22

Use of File Server - Network Template Storage 22

CCH ProSystem fx Workpaper Manager Workpaper Management Recommendations 22

Chapter 4: Deployment Planning - SQL Server Agent 24

Overview 24

Start Up Account 24

Pre-Installation Steps 24

Post-Installation Steps 25

Chapter 5: Ongoing Monitoring and Upgrade Considerations 26

Monitoring the Servers 26

Database Backup and Health Check 26

Bin Maintenance 27

Disk Space Usage 27

Disk Fragmentation 27

Chapter 6: Working with CCH ProSystem fx Workpaper Manager in the Field 28

Overview 28

Connection Types 29

Name Resolution 29

Workpaper Manager Services and Ports 32

Firewalls 33

CCH ProSystem fx Workpaper Manager Configuration Utility 35

Appendix A: Database Administration 37

Database Backup and Health Check 37

Contents

Database Maintenance Plan 38
Overview 38
Agent XPs 38
Database Maintenance Plan 38
CCH ProSystem fx Workpaper Manager Administrator Migration 40
Migrating the Office Server 40
SQL Server® Jobs 42
Database Statistics 42
Index Fragmentation 42
Transaction Log File Growth 43
Hardware Performance 43
Hardware Performance Indicators 43
CPU 43
Memory 44
Disk I/O 45
Tools Available for Hardware Performance Monitoring 45
Performance Monitor 45
Performance Dashboard Reports for SQL Server® 45
Troubleshooting Performance Issues 46
SQL Server® (x64) vs. SQL Server® (x86) with AWE Enabled 46
SQL Server® Editions 46
SQL Server® Express Edition 47
SQL Server® Standard Edition vs. Enterprise Edition 47

Appendix B: Upgrading CCH ProSystem fx Workpaper Manager 48

Before the Installation 48
Upgrading the Office Servers 48
Upgrading Workstations Using Active Directory® 49
Manually Installing the Workstations 49

Appendix C: Installing CCH ProSystem fx Workpaper Manager on a SQL Cluster 50

Before Beginning the Installation 50
Installing the Administrator Module 50
Installing the Terminal Services Database Module 51

Contents

Installing the Administrator and Terminal Services Database Module Together 52

Performing a Repair of CCH ProSystem fx Workpaper Manager on a SQL Cluster 54

Performing a Modify of CCH ProSystem fx Workpaper Manager on a SQL Cluster 54

Uninstalling CCH ProSystem fx Workpaper Manager on a SQL Cluster 54

Appendix D: Additional Resources **55**

Chapter 1

DEPLOYMENT PLANNING - CONFIGURATION

Introduction

The purpose of this document is to identify the key factors that influence the performance, reliability, and functionality of the CCH ProSystem *fx* Workpaper Manager application. These deployment guidelines can help ensure the highest possible level of reliability, sustainability, performance, predictability, and end-user usability.

The target audiences for Workpaper Manager deployment are the firm administrators and managers who make business decisions and evaluate technology and network infrastructure.

Firms that are new to Workpaper Manager, as well as firms which are upgrading an existing installation, must plan their deployment strategy well in advance of installation day.

Key decisions during planning may require answers to some of the following questions:

- What is the hardware capacity that is needed to support the anticipated peak usage? Is there a need for additional hardware?
- Does your firm prefer data in a central location or data distributed across multiple offices?
- Is there already an infrastructure established between multiple offices, such as a WAN connection? Is there a need for such an infrastructure?
- Does your firm prefer that users access Workpaper Manager through a Terminal Services Application Server? If so, is there already an Application Server in place?
- Does your firm prefer to use Citrix® with Terminal Services?
- How centralized would your firm prefer to manage workstation software installation and administration?
- Is SQL Server® Express adequate? If not, does your firm already have SQL Server® Standard or Enterprise licenses? If so, does your firm require additional licenses?
- Should your firm set up a Virtual Private Network?
- What roles and skill sets are necessary to deploy, support, and maintain Workpaper Manager?

This planning guide provides general guidance to new and existing customers in answering these questions and many more.

Chapter 1 describes seven common deployment scenarios for CCH ProSystem *fx* Workpaper Manager Workpaper Management (WM) and the associated Office Servers:

- Scenario 1. Multi-Site Firm, WM Workstations, Distributed Office Servers
- Scenario 2. Multi-Site Firm, WM Workstations, Centralized Office Servers
- Scenario 3. Multi-Site Firm, WM via Terminal Services, Centralized Office Servers
- Scenario 4. Multi-Site Firm, Terminal Services, and Local PCs
- Scenario 5. Single-Site Firm, WM Workstations
- Scenario 6. Single-Site Firm, WM via Terminal Services
- Scenario 7. Single-Site Firm, Terminal Services, and Local PCs

Subsequent chapters address the details of Server, Network, and Workstations deployment applicable to the scenarios above.

CCH ProSystem *fx* Workpaper Manager Office Servers host three basic categories of data:

- Admin data. Firm information, staff properties and staff rights, licensing information, and client information
- Central File Room data. Binders, workpaper properties, workpaper files, and notes
- Central File Room workpaper files

CCH ProSystem *fx* Workpaper Manager WM Workstations and WM Terminal Servers also host three basic categories of data:

- Admin data. Firm information, staff properties and staff rights, licensing information, and client information
- Local File Room data. Binders, workpaper properties, workpaper files, and notes
- Local File Room workpaper files

The data and files are synchronized between Office Servers and the WM Workstations or WM Terminal Servers.

Scenario 1: Multi-Site Firm, WM Workstations, Distributed Office Servers

The first scenario is a multi-site firm that has deployed a “Main” Office Server at the firm’s main site and a “Secondary” Office Server at the other sites. The Central File Rooms are thus “distributed” across the firm. At each site, users run Workpaper Management on their WM workstations and synchronize binders between Local File Rooms (on workstations) and Central File Rooms (on servers) via a high-speed Local Area Network (LAN).

While this configuration maximizes the speed at which binders are synchronized, synchronization between offices is slower in the absence of a Wide Area Network (WAN). However, WAN synchronizations are still significantly slower than LAN synchronizations.

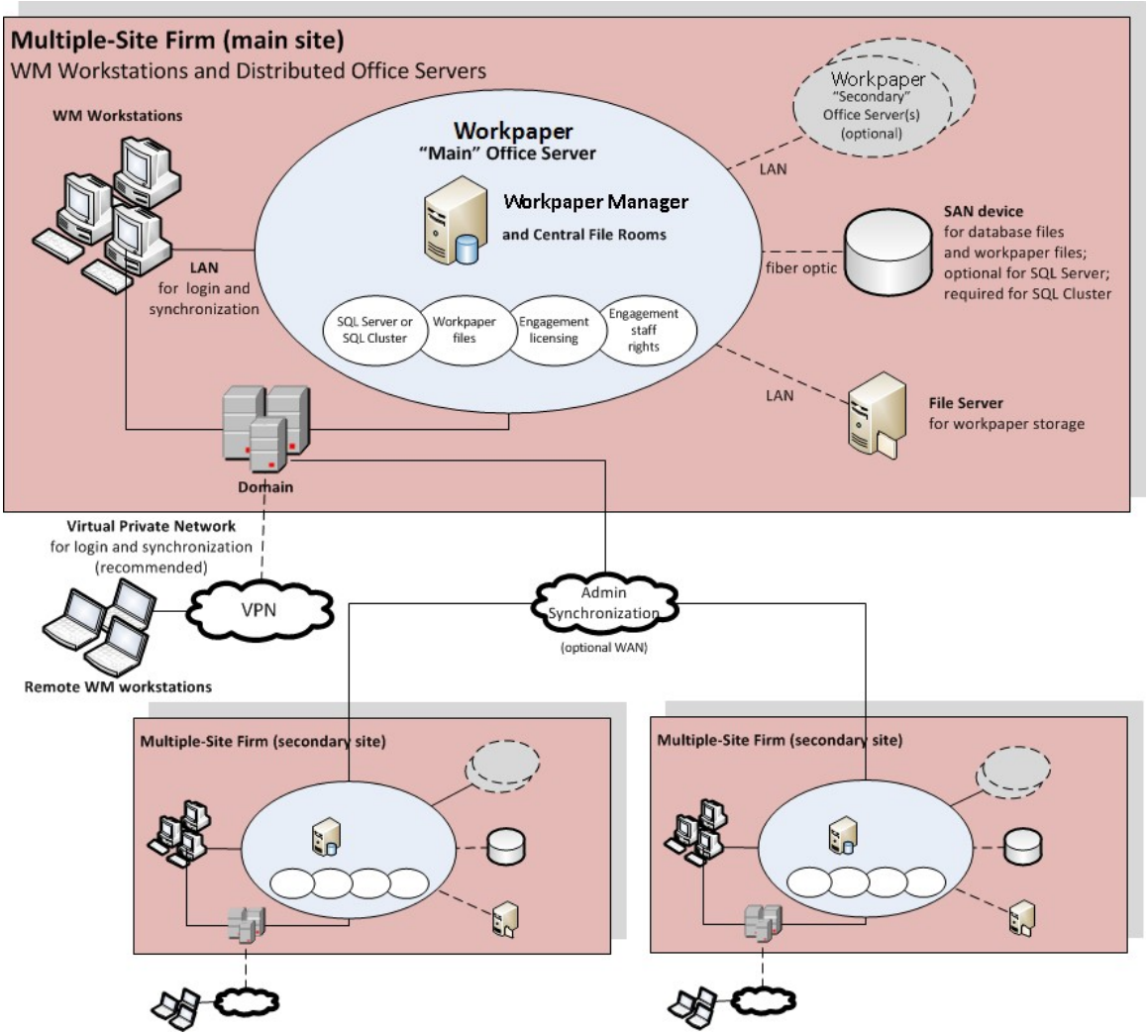


Figure 1 - Multi-Site Firm, WM Workstations, Distributed Office Servers

Optionally, Office Server performance is optimized by storing SQL database files and workpaper files on a SAN device connected to the server with a fiber optic cable.

If an optional Virtual Private Network (VPN) is configured at a site, remote users may connect to synchronize.

Scenario 2: Multi-Site Firm, WM Workstations, Centralized Office Servers

In the second scenario, there are also multiple sites, but only one site has an Office Server that is shared by all users at all sites.

This scenario minimizes server costs by eliminating the need for servers at all sites, except the main site. Because Workpaper Management is running on workstations, the server is stressed only by synchronization. Because binder synchronization typically occurs between sites, this configuration is most suitable when those sites are connected through a WAN.

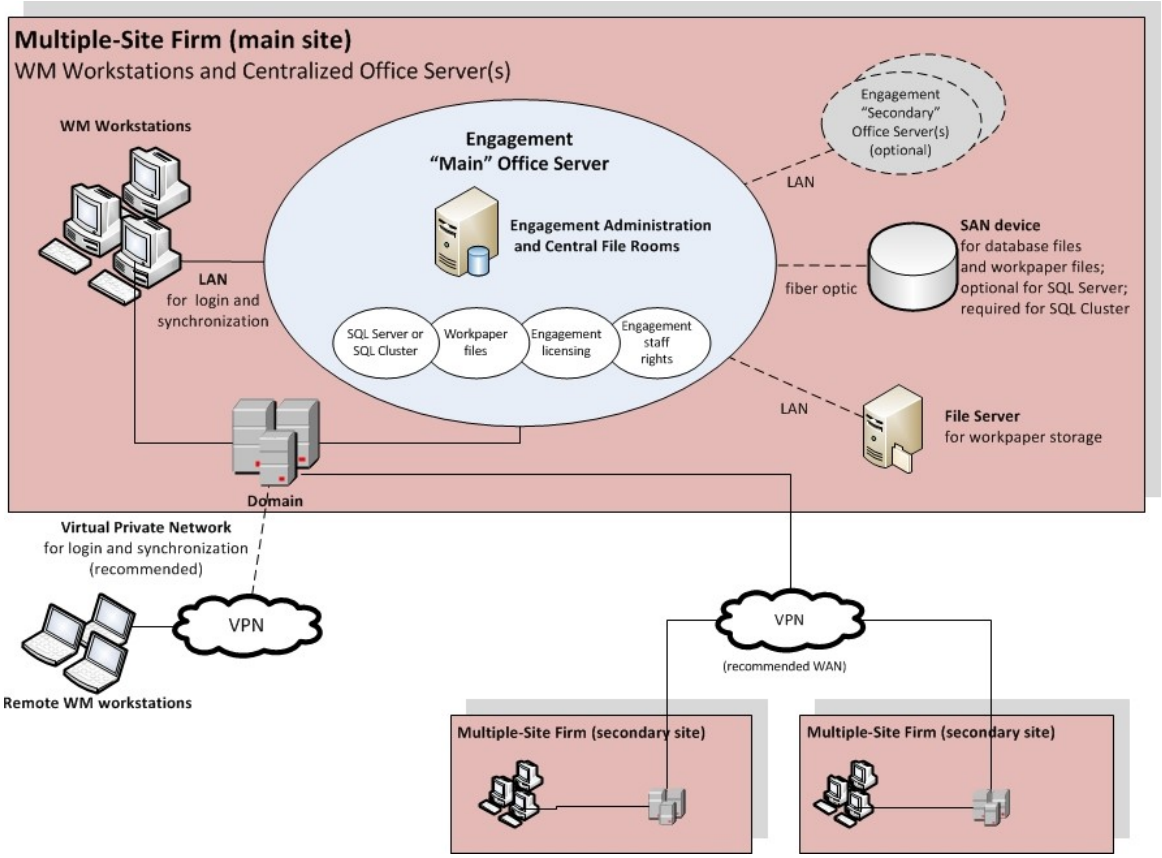


Figure 2 - Multi-Site Firm, WM Workstations, Centralized Office Servers

Scenario 3: Multi-Site Firm, WM via Terminal Services, Centralized Office Servers

This configuration uses Terminal Services to provide Workpaper Management functionality to users. This requires an adequate investment in server hardware and software; however, the bandwidth requirement between offices is less significant than with Scenario 2. Usually the Terminal Services Database Module is installed on the same machine as the Administrator Module. In some cases, to boost performance it is necessary to split the installation of the Administrator module and the Terminal Services Database module.

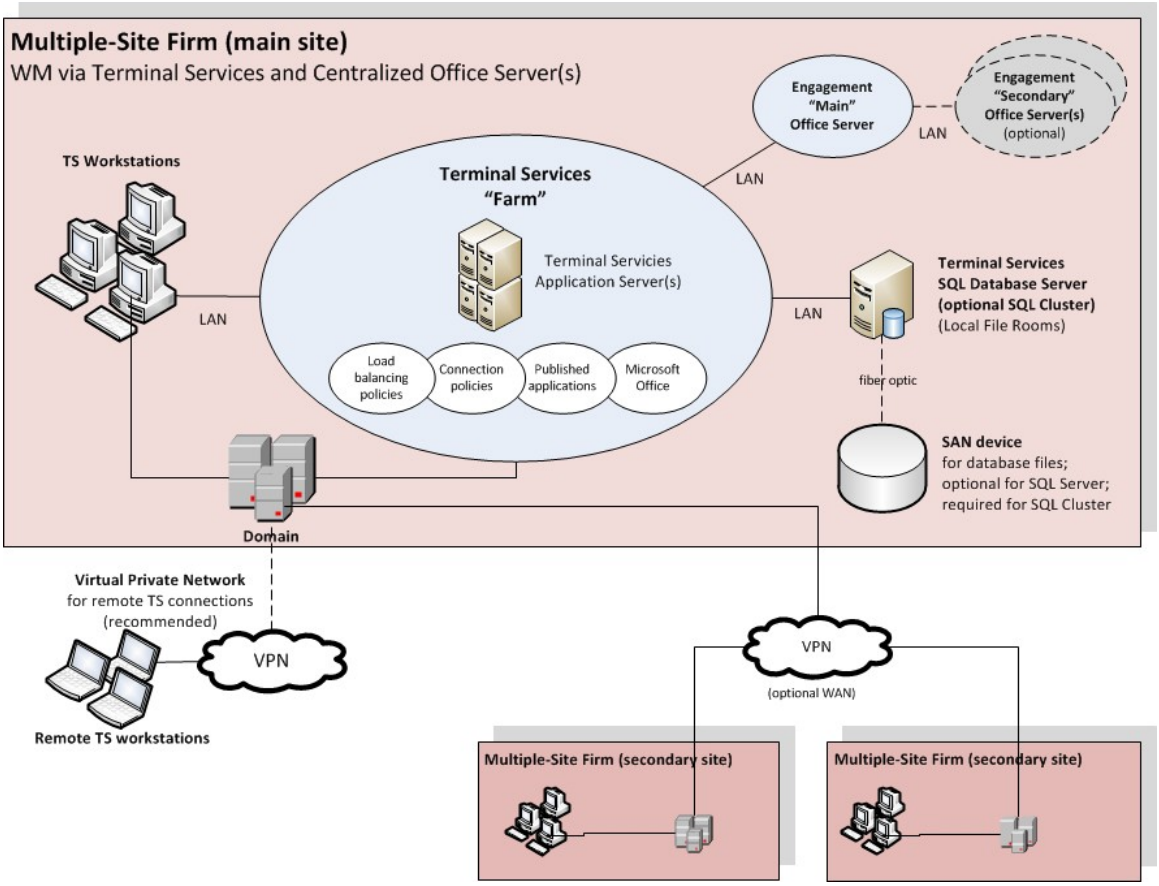


Figure 3 - Multi-Site Firm, WM via Terminal Services, Centralized Office Servers

Scenario 4: Multi-Site Firm, Terminal Services, and Local PCs

This final configuration of the multi-site firm uses Terminal Services just like Scenario 3, but also has some installations on workstations.

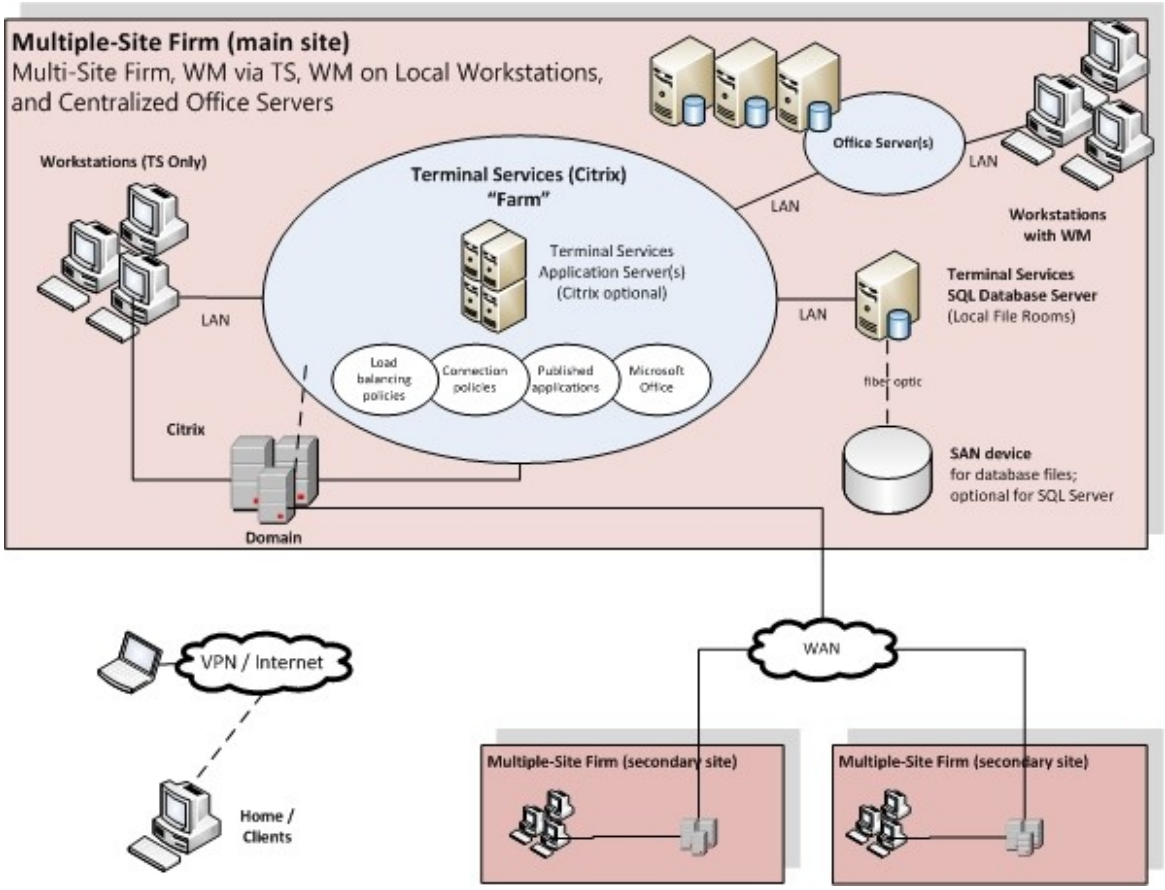


Figure 4 - Multi-Site Firm, WM via Terminal Services, WM on Local Workstations, and Centralized Office Servers

Scenario 5: Single-Site Firm, WM Workstations

The single-site scenario for WM Workstations is identical to Scenario 1, but simpler due to the absence of secondary sites.

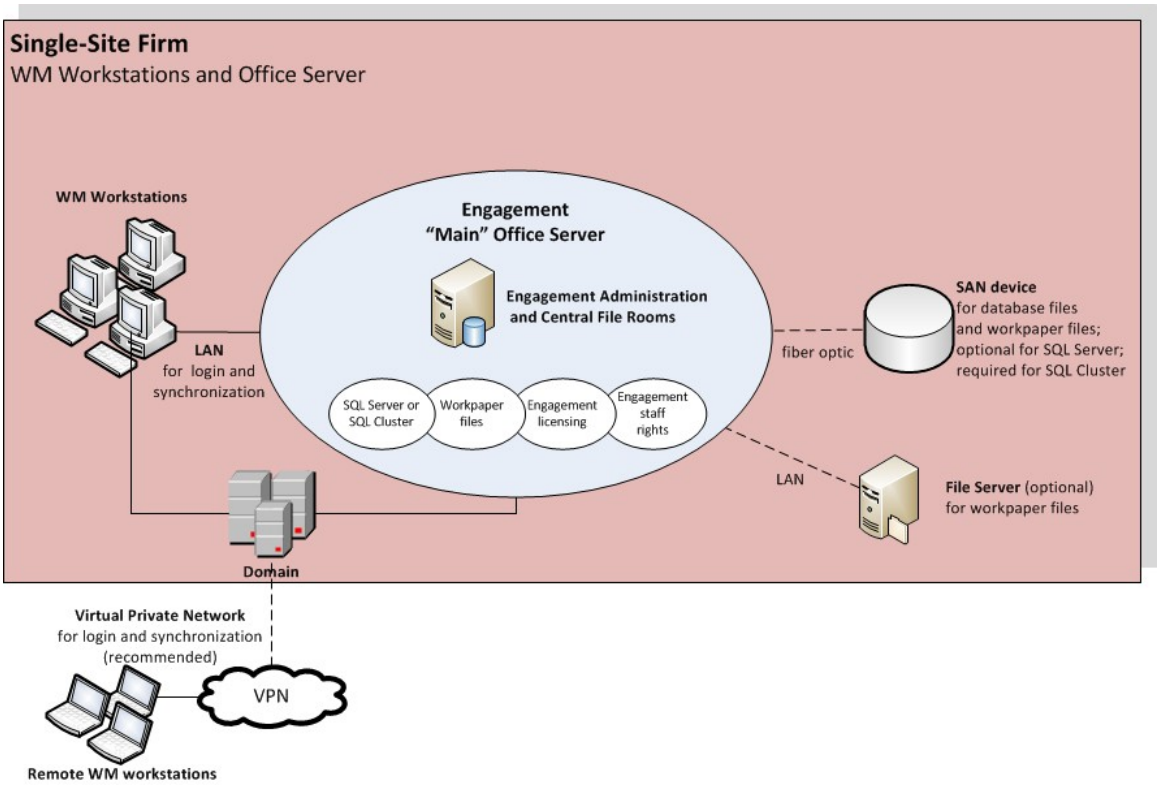


Figure 5 - Single-Site Firm, WM Workstations

Scenario 6: Single-Site Firm, WM via Terminal Services

The single-site scenario for Terminal Services is identical to Scenario 3, but simpler due to the absence of secondary sites.

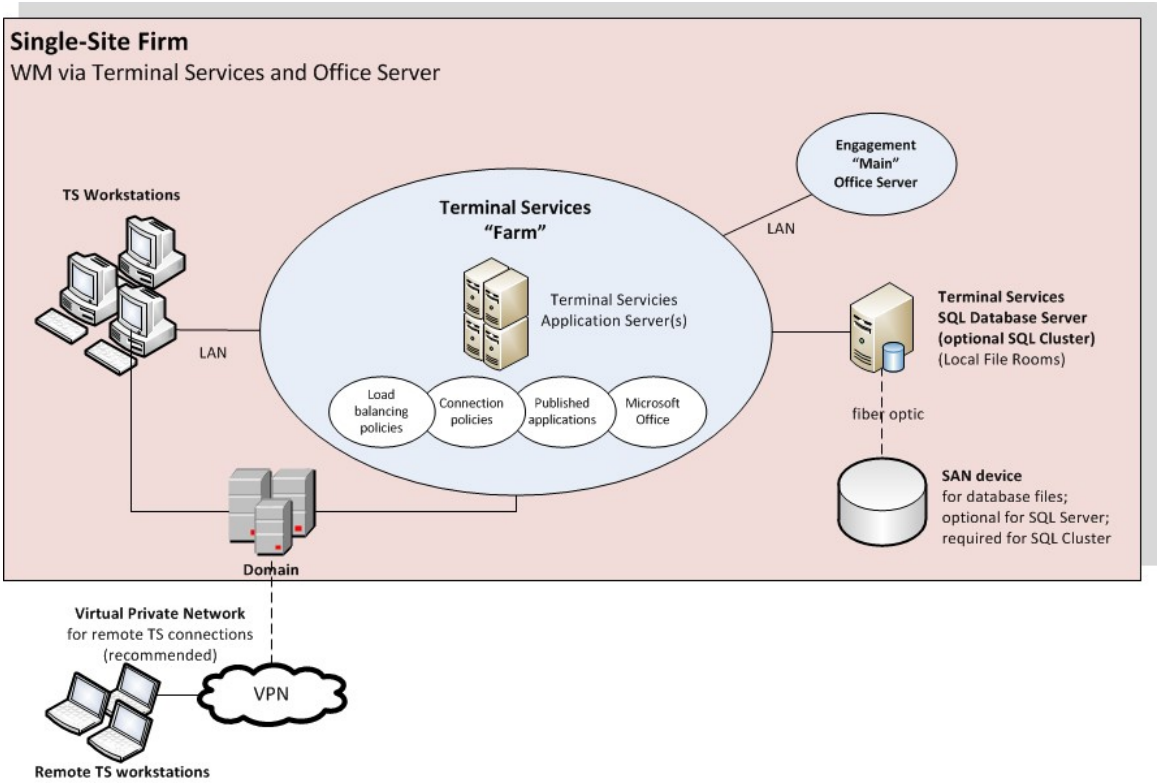


Figure 6 - Single-Site Firm, WM via Terminal Services

Scenario 7: Single-Site Firm, Terminal Services, and Local PCs

The single-site scenario for Terminal Services is identical to Scenario 4, but simpler due to the absence of secondary sites.

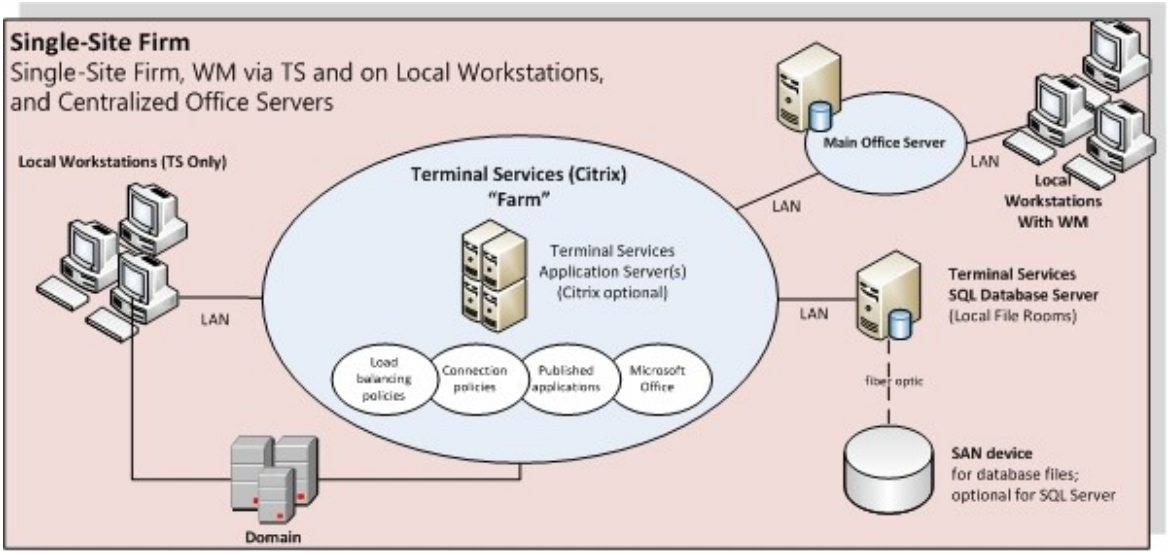


Figure 7 - Single-Site Firm, WM via Terminal Services

Other Scenarios

If none of the listed scenarios is adequate, then all parties involved need to work together to develop a sustainable, predictable, and reliable solution.

Summary of Deployment Scenario Recommendations

Deployment Configuration	Multiple-Site Firm: WM Workstations Distributed Office Servers	Multiple-Site Firm: WM Workstations Centralized Office Server(s)	Multiple-Site Firm: WM via Terminal Services Centralized Office Server(s)	Single-Site Firm: WM Workstations Centralized Office Server(s)	Single-Site Firm: WM via Terminal Services Centralized Office Server(s)
Main Office Server - central site	1	1	1	1	1
Secondary Office Servers - central site	~	~	~	~	~
Secondary Office Servers - other sites	1+	n/a	n/a	n/a	n/a
WAN for Admin synchronization	√	n/a	n/a	n/a	n/a
WAN for remote binder synchronization	~	√	n/a	n/a	n/a
VPN for remote Terminal Services	n/a	n/a	~	n/a	~
VPN for remote binder synchronization	√	√	n/a	√	n/a
WLAN (Wireless LAN) for workstations	~	~	~	~	~

Legend

√	Recommended
~	Optional
n/a	Not Applicable

Chapter 2

DEPLOYMENT PLANNING - SERVERS

Overview

The main types of servers that are implemented with CCH ProSystem *fx* Workpaper Manager are a Database Server, a File Server, and an optional Terminal Server. Key factors in deployment of these servers include the Microsoft® Windows® version, available RAM, number of CPUs, Microsoft® SQL Server® edition, high availability, and the roles and responsibilities of the IT staff supporting these servers. A final consideration is whether to have a File Server or a SAN device.

Some of these considerations vary considerably based on the firm size and the number of users. See the chart in *CCH ProSystem fx Workpaper Manager Office Server Recommendations* on page 15 for recommendations.

Database Server Overview

Microsoft® SQL Server® is the database engine used by Workpaper Manager. In this section, we describe some of the factors in deciding how to deploy SQL Server® with Workpaper Manager.

High Availability and SQL Clustering

Microsoft® SQL Clustering can be used to reduce single points of failure as part of a high availability solution. The CCH ProSystem *fx* Workpaper Manager Administrator and Terminal Services Database Modules can both be deployed in a cluster environment when a SQL Server® 2014, SQL Server® 2016, or SQL Server 2017® instance has been configured for failover.

See SQL Server® 2017, SQL Server® 2016, and SQL Server® 2014 for more information on failover instances. Installation of this environment may require the assistance of the firm's system engineer, network engineer, storage management engineer, and database administrator.

To migrate from a non-clustered environment to a clustered environment, the CCH ProSystem *fx* Workpaper Manager Backup and Restore Utility should be used. See *CCH ProSystem fx Workpaper Manager Administrator Migration* on page 40 for the firm DBA on this topic. For instructions on deploying Workpaper Manager to a SQL Cluster, see *Appendix C: Installing CCH ProSystem fx Workpaper Manager on a SQL Cluster* on page 50.

Microsoft® SQL Express® vs. Microsoft® SQL Server® Standard or Enterprise

Microsoft® SQL Express® is installed and set up with little effort by the firm, but it has limited resources and is not recommended for use with more robust environments. For recommendations on specific environments, please see the chart in *CCH ProSystem fx Workpaper Manager Office Server Recommendations* on page 15.

Microsoft® SQL Server® Standard or Enterprise editions are recommended as the best choice for deploying SQL Server®. See *SQL Server® Express Edition* on page 47 in Appendix A for more information on this topic.

Microsoft® SQL Server® (x86) with Address Windowing Extensions (AWE) vs. Microsoft® SQL Server®(x64)

Microsoft® SQL Server® (x86) only supports 2 GB of RAM by default. This is due to the 4 GB of virtual address space limitation of SQL Server® 32-bit. The x64 version of Microsoft® SQL Server® does not have this limitation. If for any reason there is a constraint that prevents installing Microsoft® SQL Server® (x64), it is still possible for Microsoft® SQL Server® (x86) to utilize more than 2 GB of RAM by enabling the AWE option. However, the maximum RAM SQL utilizes with AWE enabled depends on how much memory is supported by the corresponding operating system that is running SQL Server®.

Due to the limitations and complexity of implementing AWE, it is recommended that Microsoft® SQL Server® (x64) be installed for Enterprise solutions. See *SQL Server® (x64) vs. SQL Server® (x86) with AWE Enabled* on page 46 in Appendix A for additional information for the firm DBA on this topic.

File Servers Overview

Implementing a File Server may assist with space usage, redundancy, and in some cases performance. CCH ProSystem *fx* Workpaper Manager allows the physical files for a Central File Room on a network location. A common device used for this implementation is a SAN device. Both of these hardware choices are optional but have many advantages if implemented.

Using a SAN

Both the SAN device and the File Server provide redundancy and help with disk space usage. SAN devices typically provide better performance than the File Server when connected via a fiber channel. For this reason, a SAN device with fiber channel is recommended for Enterprise solutions.

SQL

The SAN device is used to store the SQL Databases and physical files for the Central File Room (CFR), and also the Local File Room (LFR) for a Terminal Services Database, to minimize the latency created from disk I/O with these files. The SAN device is a requirement for setup of a clustered environment.

In addition, the SAN device must be configured and recognized as a local drive for Microsoft® SQL Server® to function correctly.

Physical Files

For physical file storage of the CFR workpapers, if the drive is configured as a local drive, similar to the configuration for using the SAN device as previously mentioned, a UNC path is not necessary. Physical files that are located on a File Server network require a UNC path.

Microsoft® Windows Server®

We recommend Microsoft® Windows Server® 2012 R2 (x64), Microsoft® Windows Server® 2016 (x64), or Microsoft Server® 2019 as the base operating system for all servers. The following link has more information from Microsoft® on RAM Limitations. Microsoft® Small Business Server® (this includes Server 2011 Essentials and Server 2012 Essentials), Windows Server® Essentials, and Windows Server® Foundation are not supported.

Hardware Considerations

RAM, CPUs (or cores on the CPUs), and file storage have the biggest impact on performance. For the database server, the highest performance is achieved when RAM is equal to the size of all the databases simultaneously loaded into memory to avoid swapping from the hard disk. The exact minimum amount of RAM varies depending on firm usage. The recommendations in this guide are for optimal performance.

The base recommendation for the larger more robust servers is to have anywhere from 32 GB of RAM to 64 GB of RAM. For application servers, CCH ProSystem *fx* Workpaper Manager, Microsoft® SQL Server®, and Microsoft® Office are used. The recommended amount of RAM for application servers is 32 GB of RAM and a maximum of 20 users per server.

Indications of a bottleneck of CPU utilization are when CPU utilization is constantly over 80% and servers with high usage are operating with less than 24 cores. In addition, x64 processors are required to install the x64 versions of Microsoft® Windows Server® 2012 R2, Windows Server® 2016, and Windows Server® 2019 as previously recommended.

Too much disk I/O is expensive, so preventing or minimizing the impact of when heavy disk I/O actually does happen is important. SAN devices are a good solution for this aspect and are recommended for systems with over 250 connected users.

More details on monitoring the hardware and performance considerations are in *Chapter 5: Ongoing Monitoring and Upgrade Considerations* on page 26 and *Hardware Performance* on page 43 in Appendix A.

Firm IT Staff Roles and Responsibilities

Certain roles and skill sets within the firm are necessary for Workpaper Manager to perform optimally:

- **System Engineer for Windows Servers®**. Assists in the design, testing, and implementation stages of Windows® Projects. This role should have working knowledge of Microsoft®

Windows® operating systems, Active Directory®, DNS, Terminal Services and Group Policy.

- **Network Engineer**. Installs, configures, and maintains network services and devices.
- **SQL DBA or Database Administrator**. Installs, configures, and maintains the machines with Microsoft® SQL Server®. This includes monitoring the performance, making any tuning adjustments, and performing backup processes. *Chapter 5: Ongoing Monitoring and Upgrade Considerations* on page 26 and *Appendix A: Database Administration* on page 37 includes specific details on this role.
- **Storage Management Engineer**. Plans, sets up, and administers file servers and SAN devices.
- **Security Analyst**. Implements and maintains the firm's security policies, which include Workpaper Manager, the services, SQL, firewalls, and ports.
- **Deskside Technician**. Installs Workpaper Manager on laptops and workstations, diagnoses end user issues, and establishes network connectivity.
- **Desktop Engineer**. Shares some of the same responsibilities as the Deskside Technician, except this role is responsible for physically setting up the system. The Desktop Engineer may also test hardware and software to see if it fits the firm's needs. This role is also responsible for performing an Active Directory® Push of the installation.

These roles help design the initial setup and provide ongoing maintenance of the environment. Staff with these skills can perform troubleshooting or performance tuning. The configuration and complexity of your firm's network and database structures will determine the types of roles and skill levels required. A single IT staff can perform one or more of the roles depending on their skill set.

Virtualization

The virtual machine must meet the same system requirements for Workpaper Manager as a physical machine. Please consult with your virtualization vendor for specific recommendations.

Upgrading CCH ProSystem *fx* Workpaper Manager

You can take several steps to make the upgrade from a prior version go smoothly. The first step is reviewing all documentation, including the Release Notes, the knowledge base article Installation Guidance for CCH® ProSystem fx® Engagement and CCH® ProSystem fx® Workpaper Manager, and this Deployment Planning Guide.

You can also do the following to help ensure data integrity:

- Synchronize binders to the Central File Room
- Perform a backup both before and after the upgrade using the CCH ProSystem *fx* Workpaper Manager Backup and Restore Utility
- Check for compressed databases

For detailed instructions on upgrading, see *Appendix B: Upgrading CCH ProSystem fx Workpaper Manager* on page 48.

CCH ProSystem *fx* Workpaper Manager Office Server Recommendations

The following chart contains recommendations for deploying Workpaper Manager Office Servers, also known as the Administrator module. Office Servers are both Database Servers and File Servers. This chart shows the different considerations, including SQL Server®, File Storage, and architecture.

	200+ Users per Office Server	75-200 Users per Office Server	<75 Users per Office Server
Office Servers			
Hardware			
RAM	32+ GB	8-32 GB	4-8 GB
Processors - total cores	8+ cores	2-8 cores	2-4 cores
x64 processor	√		
x86 processor	X	X	~
Microsoft® Windows Server®			
Microsoft® Windows Server® 2019	√		
Microsoft® Windows Server® 2016	√		
Microsoft® Windows Server® 2012 R2	√		
Microsoft® Windows Server® 2012	√		
Microsoft® SQL Server®			
Microsoft® SQL Server® 2016 - 2017 Enterprise (64-bit)	√	~	~
Microsoft® SQL Server® 2016 - 2017 Standard (64-bit)	√	√	~
Microsoft® SQL Server® 2016 - 2017 Express (64-bit)	X	X	~
Microsoft® SQL Server® 2014 - any 32-bit edition	X	X	~
Microsoft® SQL Server® 2014 Enterprise (64-bit)	√	~	~
Microsoft® SQL Server® 2014 Standard (64-bit)	√	√	~
Microsoft® SQL Server® 2014 Express (64-bit)	X	X	~
Microsoft® SQL Server® 2012 - any 32-bit edition	X	X	X
Microsoft® SQL Server® 2012 Enterprise (64-bit)	X	X	X
Microsoft® SQL Server® 2012 Standard (64-bit)	X	X	X
Microsoft® SQL Server® 2012 Express (64-bit)	X	X	X
Storage			
SAN storage for SQL database files	√	√	~
SAN storage for CFR workpapers	√	√	~
LAN file server for CFR workpapers	X	~	

Legend	
√	Recommended
~	Optional
X	Not Recommended
X	Not Supported

The recommendations for installing Workpaper Manager Office Servers, including some of the optional components from the previous chart, can be found on the Customer Support Web site under the CCH ProSystem *fx* Workpaper Manager System Requirements tab.

Terminal Servers

Terminal Servers, although optional, allow for the use of the application server/database server topology. A few typical scenarios are generally chosen for this section.

Refer to *Chapter 1: Deployment Planning - Configuration* on page 1 for more details on Terminal Services, more specifically *Scenario 3: Multi-Site Firm, WM via Terminal Services, Centralized Office Servers* on page 5 and *Scenario 5: Single-Site Firm, WM Workstations* on page 7.

CCH ProSystem *fx* Workpaper Manager Terminal Services Client Overview

Application servers, dedicated for application files and no user data, are sometimes part of a farm. Workpaper Manager will install on any machine with the Terminal Services Role installed. These machines link to the database server with CCH ProSystem *fx* Workpaper Manager Terminal Services Database. The Terminal Services Client Module requires that Microsoft® Office already be installed on the terminal server or Citrix® box.

Terminal Services Client Recommendations

The following chart contains recommendations in regards to deploying Workpaper Manager on Terminal Services. We start with the recommendation of 20 users per Terminal Server, and then show recommendations for operating systems, Microsoft® Office, and hardware. See *Microsoft® Office* on page 20 for more details on the recommendations for Microsoft® Office.

	200+ Users per TS Farm	41-200 Users per TS Farm	<40 Users per TS Farm
Terminal Services Application Servers			
Peak Users			
Application servers	10+	2-15	1-2
Peak users per application server	20 users		10-20 users
Hardware			
RAM	16+ GB		8-16 GB
Processors - total cores	8-16 cores		4-8 cores
x64 processor	√		
x86 processor	X		
Microsoft® Windows Server®			
Microsoft® Windows Server® 2019	√		
Microsoft® Windows Server® 2016	√		
Microsoft® Windows Server® 2012 R2	√		
Microsoft® Windows Server® 2012	√		
Microsoft® Windows Server® 2008 R2	X		
Microsoft® Windows Server® 2008	X		
Microsoft® Small Business Server®	X		
Microsoft® Office			
Microsoft® Office 365™ - Desktop version	√		
Microsoft® Office 2019	√		
Microsoft® Office 2016	√		
Microsoft® Office 2013	√		
Microsoft® Office 2010	X		
Microsoft® Office 2007	X		

Legend		
	√	Recommended
	~	Optional
	X	Not Recommended
	X	Not Supported

The recommendations for the installation of CCH ProSystem *fx* Workpaper Manager Terminal Services Client, including some of the optional components from the chart, can be found on the Customer Support Web site under the CCH ProSystem *fx* Workpaper Manager System Requirements tab.

Terminal Services Database Overview

Microsoft® SQL Server® and the prerequisites for SQL are installed first on these servers. This type of server is considered both a database server and a File Server as it contains both the physical files, such as Microsoft® Excel® and Microsoft® Word, and the CCH ProSystem *fx* Workpaper Manager database files.

Terminal Services Database Recommendations

The following chart contains recommendations regarding deployment of the CCH ProSystem *fx* Workpaper Manager Terminal Services Database. This module is used in conjunction with one or many CCH ProSystem *fx* Workpaper Manager Terminal Services Client installations. The recommendations are for Microsoft® Windows®, Microsoft® SQL Server®, file storage, and hardware.

	200+ Users per TS Farm	41-200 Users per TS Farm	<40 Users per TS Farm
Terminal Services Application Servers			
Peak Users			
Application servers	10+	2-15	1-2
Peak users per application server	20 users		10-20 users
Hardware			
RAM	16+ GB		8-16 GB
Processors - total cores	8-16 cores		4-8 cores
x64 processor	√		
x86 processor	X		
Microsoft® Windows Server®			
Microsoft® Windows Server® 2019	√		
Microsoft® Windows Server® 2016	√		
Microsoft® Windows Server® 2012 R2	√		
Microsoft® Windows Server® 2012	√		
Microsoft® Windows Server® 2008 R2	X		
Microsoft® Windows Server® 2008	X		
Microsoft® Small Business Server®	X		
Microsoft® Office			
Microsoft® Office 365™ - Desktop version	√		
Microsoft® Office 2019	√		
Microsoft® Office 2016	√		
Microsoft® Office 2013	√		
Microsoft® Office 2010	X		
Microsoft® Office 2007	X		

Legend		
	√	Recommended
	~	Optional
	X	Not Recommended
	X	Not Supported

The recommendations for the installation of the CCH ProSystem *fx* Workpaper Manager Terminal Services Database, including some of the optional components from the chart, can be found on the Customer Support Web site under the CCH ProSystem *fx* Workpaper ManagerSystem Requirements tab.

Summary

Various hardware and software choices are made prior to deploying Workpaper Manager. The server choices include operating system, amount of RAM, number of processors, and infrastructure. The choices are based on the role of the server as well as the usage. Several recommendations exist as a starting point, such as 64-bit operating systems, the use of Microsoft® Standard or Enterprise Edition of SQL Server®, and SAN devices for larger firms. As stated in *Chapter 1: Deployment Planning - Configuration* on page 1, a few scenarios are generally chosen based on the firm's needs.

Chapter 3

Deployment Planning - Workstations

In an Enterprise environment, deploying Workpaper Manager means deploying the application to possibly hundreds of workstations. This factor alone warrants planning the deployment of these workstations. This chapter covers:

- Microsoft® Windows®
- Microsoft® Office
- Microsoft® SQL Server®
- Installation
- Security
- Use of a File Server
- Hardware considerations
- Roles of the IT staff

Microsoft® Windows®

Windows® 8.1 or Windows® 10 is recommended for the operating system choice on workstations. See the Microsoft® Windows® Web site for more information.

Microsoft® Office

Workpaper Manager supports the features and benefits of:

- Microsoft® Office 2013
- Microsoft® Office 2016
- Microsoft® Office 2019
- Microsoft® Office 365™ - Desktop version

These features include the Office task-oriented ribbon interface, greater document capacity, and new customization features.

Note: The Microsoft® Office 365™ Online version is not supported.

Microsoft® SQL Server®

For workstations, Microsoft® SQL Express® is recommended. Microsoft® Standard or Enterprise edition are only necessary for servers. The recommended versions are:

- Microsoft® SQL Server®2017
- Microsoft® SQL Server® 2016
- Microsoft® SQL Server® 2014

Starting with Microsoft® SQL Server® 2016, you can only install a 64-bit version of the software. If you already have a 32-bit version of a SQL instance installed, there is not a traditional upgrade path to a 64-bit platform. To move to a 64-bit platform of SQL Server®, you will need to uninstall the 32-bit SQL instance and then re-install the instance using the 64-bit version.

For more information, please refer to this Microsoft article.

Note: Prior to performing any installation processes with your SQL instance, be sure to use the proper SQL backup procedures for the installed instance to prevent data loss. Once the installation procedure is completed, you can restore your 32-bit backup to the 64-bit version of the instance without issue.

Hardware Considerations

RAM, CPUs (or cores on the CPUs), and the hard disk have the biggest impact on performance. As stated in the Office Server section of Chapter 2, Workpaper Manager uses Microsoft® Office and Microsoft® SQL Server®, so the system needs enough memory to run all of these applications along with other applications used by your firm. The recommendation for a workstation is 4 GB of RAM.

An indication of a possible hardware bottleneck is when CPU utilization is constantly over 80%. A dual- or quad-core processor is recommended. More details on monitoring the hardware and performance considerations are in *Chapter 5: Ongoing Monitoring and Upgrade Considerations* on page 26 and *Hardware Performance* on page 43 in Appendix A.

Installation

Workpaper Manager has several prerequisites before installation. The most important of these is a Microsoft® SQL Server®. For workstations, Microsoft® SQL Express® is easily installed from the Workpaper Manager Install Media and is already configured through the installer. Microsoft® SQL Express® is not the only requirement, however. The knowledge base article Installation Guidance for CCH® ProSystem fx® Engagement and CCH® ProSystem fx® Workpaper Manager provides links and information to help you identify other components that are required prior to installing Workpaper Manager.

Active Directory® Push

Once all of the prerequisites are installed on the workstations, Active Directory® can be used to push out the Workpaper Manager MSI installer. By using this method, possibly several hundred machines can be updated at the same time. Refer to the knowledge base article How do I push an installation through Active Directory® when installing CCH® ProSystem fx® Engagement or CCH® ProSystem fx® Workpaper Manager? for more detailed instructions.

Security

Encryption, user rights, firewalls, virus scanning, script blocking, and Windows® service packs are common forms of protection against security breaches. Microsoft® Office also has its own set of security restrictions. If the restrictions on this software are not managed correctly, some functionality inside Workpaper Manager is blocked. Refer to the knowledge base article How do I push an installation through Active Directory® when installing CCH® ProSystem fx® Engagement or CCH® ProSystem fx® Workpaper Manager? for more information.

Use of File Server - Network Template Storage

As previously stated in Chapter 2, a File Server is beneficial to your firm. Workpaper Manager utilizes several different types of templates. These templates are used for the creation of new binders, workpapers, account groupings, and trial balances. These templates are created and stored locally by default but are sometimes placed on a network location, if desired. If these templates are moved to the network, they are only accessible when the workstations have access to that location. If the workstations leave the office, they will need the templates locally.

CCH ProSystem *fx* Workpaper Manager Workpaper Management Recommendations

The following chart contains recommendations in regards to deploying the CCH ProSystem *fx* Workpaper Manager Workpaper Management, including recommendation on hardware, Microsoft® Office, Microsoft® Windows®, and Microsoft® SQL Server®.

Workstations	
Hardware	
RAM	4+ GB
Processors - total cores	2+
x64 processor	√
x86 processor	√
Microsoft® Windows	
Microsoft® Windows 10	√
Microsoft® Windows 8.1	√
Microsoft® Windows 7	√
Microsoft® Windows Vista	X
Microsoft® Windows XP	X
Microsoft® SQL Server®	
Microsoft® SQL Server® 2017 Express (64-bit)	√
Microsoft® SQL Server® 2016 Express (64-bit)	√
Microsoft® SQL Server® 2014 Express (32- or 64-bit)	√
Microsoft® SQL Server® 2012 Express (32- or 64-bit)	X
Microsoft® SQL Server® 2008 R2 Express (32- or 64-bit)	X
Microsoft® SQL Server® 2008 Express (32- or 64-bit)	X
Microsoft® Office	
Microsoft® Office 365™ - Desktop version	√
Microsoft® Office 2019	√
Microsoft® Office 2016	√
Microsoft® Office 2013	√
Microsoft® Office 2010	X
Microsoft® Office 2007	X

Legend	
√	Recommended
~	Optional
X	Not Recommended
X	Not Supported

The recommendations for the installation of CCH ProSystem *fx* Workpaper Manager Terminal Services Client, including some of the optional components from the chart above can be found on the Customer Support website under the CCH ProSystem *fx* Workpaper Manager System Requirements tab.

Chapter 4

Deployment Planning - SQL Server Agent

Overview

SQL Server Agent is typically enabled to run in the Workpaper Manager database operations for two purposes:

1. To support the database maintenance plan.
2. To support SQL Server clustering.

Start Up Account

The startup account can be configured in *Services* to indicate on whose behalf the SQL Agent service will be running, and it will be used inside the SQL Agent to make database connections to the corresponding SQL instance. All Windows® Accounts (except for the [BUILTIN\Administrators] accounts) are to be revoked from the SQL instance during the Workpaper Manager installation process. If the SQL Agent is running on your system with a startup account other than the BUILTIN\Administrators accounts, then the installer will fail to delete that account, hence, it will fail to complete. It is necessary to follow the *Pre-Installation* and *Post-Installation Steps* below in order to prevent the Workpaper Manager installation from failing.

Note: The “Local System Account” or “LocalSystem” Account, also known as “NT AUTHORITY\SYSTEM” Account is a member of the BUILTIN\Administrators group.

Pre-Installation Steps

1. From Windows®, open and view the *LocalServices*.
2. Right-click on the **SQL Server Agent (PROFXENGAGEMENT)**.
3. Select **Properties**.
4. Right-click on the **Log On** tab and note the startup account name currently used. If the start up account is a “Local System Account,” you may skip the rest of the steps; otherwise, continue.
5. Click on the **General** tab.

6. Click the **Stop** button to stop the service. This will allow the referenced account to be removed from the SQL Server catalog during the installation process.
7. Click **OK** to close the window.

Post-Installation Steps

If you stopped the SQL Agent during the *Pre-Installation Steps*, you must add the startup account back to the SQL instance and start the SQL Agent manually:

1. Login to the **SQL Server (PROFXENGAGEMENT)** instance from SQL Management Studio as "sa" or with Windows® Authentication.
2. From the *View* menu, select **Object Explorer\Expand Security**.
3. Right-click on the **Logins** and select **New Login**.
4. Search and locate the Windows® Account noted in the *Pre-Installation Steps*.
5. Click the **Server Roles** tab and check **sysadmin**.

   Note: Add a new account with the [sysadmin] role at your own risk.

6. Click **OK**.
7. From Windows®, open and view the *Local Services*.
8. Right-click on the **SQL Server Agent (PROFXENGAGEMENT)**.
9. Select **Properties**.
10. Click on the **Log On** tab and verify that the startup account name you previously noted when stopping the service is still shown. If not, enter or select that *account name*.
11. Click on the **General** tab.
12. Click the **Start** button to start the service. This will allow the account to be added back to the SQL Server catalog.
13. Click **OK** to close the window.

Chapter 5

Ongoing Monitoring and Upgrade Considerations

Monitoring the Servers

Monitoring the health of the machines using CCH ProSystem *fx* Workpaper Manager is essential to ensure the best performance is achieved and to determine when an upgrade is necessary. There are three basic areas to monitor, RAM usage, CPU usage, and disk I/O. Disk I/O is one of the slowest functions on a system and heavy disk I/O will affect performance. Several counters are setup to monitor the disk I/O. A SAN device with fiber channels is also used to help performance with heavy disk I/O.

RAM will contribute to disk I/O if there is memory pressure; monitoring the memory usage is recommended. Consider that Microsoft® SQL Server® is a memory intensive application and by default will use as much memory as the operating system will allow. The final consideration for hardware is the processor. If the usage is constantly over 80%, an upgrade might be necessary. Monitoring the process at the same time as the RAM is ideal.

Consider all of the topics in this Chapter to create a clear picture of future hardware and software requirements. The counters help determine if more RAM is needed, more processing power is needed, or if the disk is too slow. *Appendix A: Database Administration* on page 37 has some detailed information on exactly what to monitor and when to upgrade.

Database Backup and Health Check

Data integrity to the firm is important and the CCH ProSystem *fx* Workpaper Manager Database Backup and Restore Utility assists the firm in this manner. The utility has a built-in health check for each of the SQL databases and will mark both the log file and the backup file with "Failed -" appended to the name in the case of an unsuccessful backup. The firm must create a Microsoft® Windows® scheduled task for this utility to perform these backups on a nightly basis. The utility will not back up the physical workpaper files. This is done by a separate task or 3rd party software. It is possible to use other backup techniques but CCH ProSystem *fx* Workpaper Manager Database Backup and Restore allows for single-binder restoration. *Database Backup and Health Check* on page 37 in Appendix A has more details on this topic.

Bin Maintenance

By default, bin maintenance tasks are scheduled to run on a nightly basis. It is important to monitor the result of each run on a daily basis to make sure all steps are executed successfully. This will help to ensure sufficient database space is used in each bin and the database statistics are up-to-date. Pay special attention to the bin diagnostics report, which displays the first time an administrator logs in to the Office Server after each nightly task is run. You can also view this report by selecting **Tools > Bin Diagnostic Report** in the Administrator module. It is recommended to avoid overlap among different CCH ProSystem *fx* Workpaper Manager nightly tasks, and between a CCH ProSystem *fx* Workpaper Manager nightly task and other nightly tasks, such as Windows® updates.

Disk Space Usage

Make sure the disk drives hosting the database files have sufficient disk space for the database files to grow. Checking the location of the physical files is also recommended. At minimum, both tasks should be performed on a weekly basis.

Disk Fragmentation

Since disk fragmentation may have significant impact on performance, it is recommended to monitor the disk fragmentation on the hard drives hosting the CCH ProSystem *fx* Workpaper Manager SQL .mdf and .ldf files on a weekly basis, and if significant numbers of fragments are detected, defragmentation of the hard drive level should be performed.

Chapter 6

Working with CCH ProSystem fx Workpaper Manager in the Field

Overview

This document, along with the Workpaper Manager Help files and installation articles in the knowledge base, can help you understand and resolve common issues. The instructions here are for use by Workpaper Manager users working together with their network administrators and IT professionals.

For a basic usage background, we strongly encourage you to read the help topic *Synchronizing with a Local File Room*. This topic gives a step-by-step overview of the Field Synchronization process, which you should understand to effectively create and use a field environment. To locate this topic from in Workpaper Manager, select **Help > Help Topics**, and then open the topic **Sharing and Distributing Binders > Peer-to-Peer Network Environment > Field Synchronization/Synchronizing with a Local File Room**.

Synchronizing data is an essential function. For synchronization to work properly, it is critical that the operating system can resolve the names of the other machines involved in this process. This can be a challenge in the field for two primary reasons:

- The machines are no longer using the servers in the office, including the DNS server.
- Four ports are required for synchronization. These must be open and not blocked by a firewall.

It is important to create and test a simulated field environment while you are in the office. This can be done on a conference room table, using the actual laptops, networking cords, and other networking equipment that is used in the field. Every office is different; it is important to establish a set of steps that works for your equipment before you go to the field. If there are difficulties, it is much easier for you to work with Workpaper Manager support representatives to find and implement a solution before the team is on an actual job in the field where time is critical, and users may be far from the office.

Any type of network connection can work with Workpaper Manager, as long as it provides network connectivity between the machines that will be used for field synchronization. Generally, the difficulties are not due to the specific type or brand of hardware being used, but are related to the myriad network configuration settings that must be considered for every unique environment. The remainder of this document focuses almost exclusively on these configuration settings rather than the underlying hardware.

Connection Types

Workpaper Manager can work with many types of network connections. As long as a connection meets all of the requirements, then the type of connection is not important. The connection type can affect factors such as speed and reliability, but do not determine whether Workpaper Manager will work. Workpaper Manager will use any connection type that meets its requirements.

Some possible connection types that can be used for field synchronization with Workpaper Manager include:

- Hub/Router
- Wireless Access Point
- Ad Hoc Wireless
- Client Network

While each of these connection types can work with Workpaper Manager, each has different characteristics and can require different setup steps. It is the responsibility of your IT staff to assist with the setup and configuration of the network connection type, based on the available equipment and capabilities.

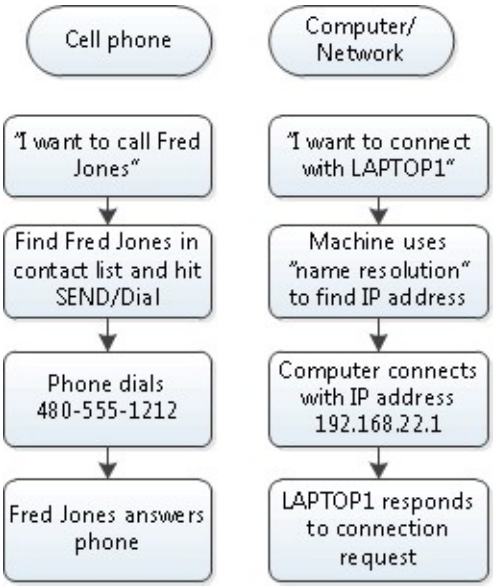
Name Resolution

The first and most important challenge in any field synchronization is to confirm that proper name resolution exists between the machines that will be connecting together. The basic concept of name resolution is quite simple. However, the process is complicated by many factors, including:

- IP address changes
- Server not available
- Client network setup
- Hub/router setup
- Microsoft® Windows® version
- Firewall settings.

When the machines cannot resolve each other's names, you can use the Networking tab of the CCH ProSystem *fx* Workpaper Manager Configuration Utility to assist with name resolution. See the section on the next page that describes the usage of this utility.

Name Resolution Illustration



The following explores some of the issues around name resolution, and provides tips for troubleshooting and resolving these issues.

Finding the IP Address and Machine Name

When a computer is booted, it is assigned an IP address, a unique set of four or six numbers that identifies the machine on the network. It is the basis for all network communications. When the machine is booted, it looks for a network connection and requests to be assigned an IP address from that network connection source.

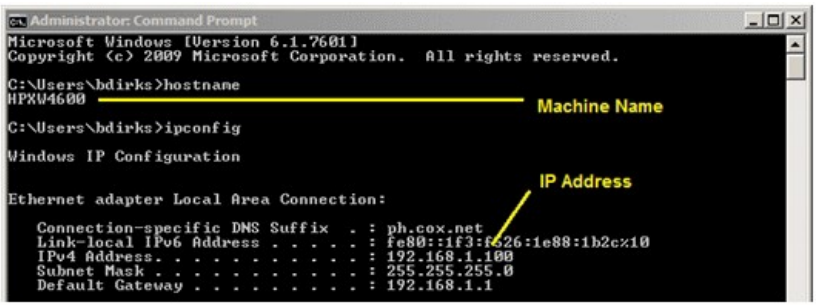
In a normal office network, this address is provided by a Windows® DNS server. However, if the machine is being booted from a remote location outside the office, the machine can get its IP address from a number of different places. This wide variety of connection types can cause a machine's IP address to change often. That is why it can be very difficult to connect machines with each other when taken out of the standard office environment.

Machine Location	IP address source
Connected to office network	DNS server in office
Connected to client's network	DNS server on client's network
Connected to hub/router	Hub/router
Coffee shop or airport	Wireless router in coffee shop or airport
Cell phone or air card	Cell phone network provider
Company VPN	Windows® DNS server in office
Not connected to any network	Machine uses a self-generated IP address

When connecting machines in the field, it is very important to know the name of each machine, as well as where each machine is getting its IP address from at any given moment. Workpaper Manager relies on a working network connection to connect successfully for field synchronization.

To find the machine name and IP address, do the following:

1. Select **Start > All Programs > Accessories> Command Prompt**.
2. Enter *hostname* at the command line and press **Enter**. Your machine name displays below the command prompt.
3. Enter *ipconfig* at the command line and press **Enter**. Your IP address displays below the command prompt.



Once you know the IP address and name for each machine, you can test if a connection exists between the machines and if there is the proper name resolution for the machines.

Testing IP Address Connections

To test for a connection, run a “ping” command for the machines in your group.

1. On your computer, select **Start > All Programs > Accessories > Command Prompt**.
2. Enter *ping <IP address>* at the command line and press **Enter**. Replace *<IP address>* with the IP address of another computer in the group. If the connection was:
   - Successful, you see the message *Packets: Sent = #, Received = #, Lost = 0 (0% loss)*.
   - Unsuccessful, you see the message *Packets: Sent = 0, Received = 0, Lost = # (100% loss)*.

Testing Name Resolution

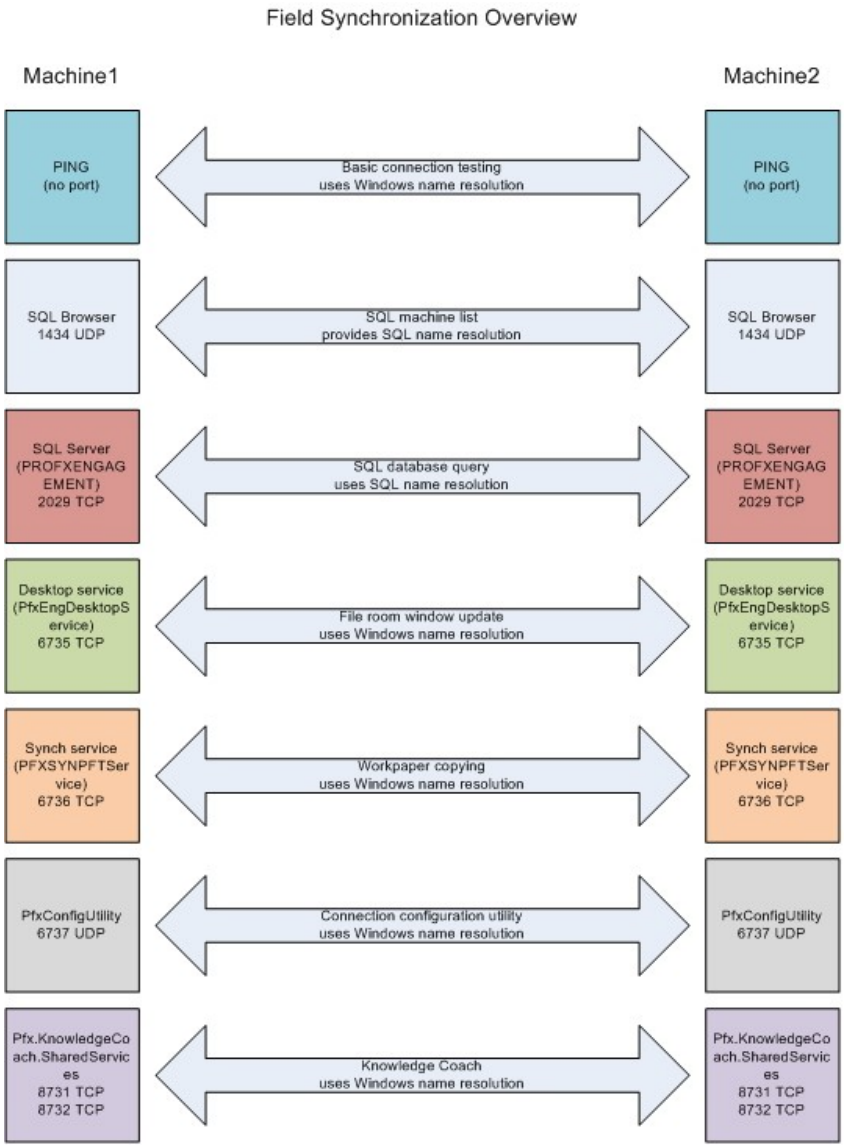
Testing name resolution uses the machine name instead of the IP address.

1. On your computer, select **Start > All Programs > Accessories > Command Prompt**.
2. Enter *ping <machine name>* at the command line and press **Enter**. Replace *<machine name>* with the machine name of another computer in the group. If the connection was:
   - Successful, you see the message *Packets: Sent = #, Received = #, Lost = 0 (0% loss)*.
   - Unsuccessful, you see the message *Packets: Sent = 0, Received = 0, Lost = # (100% loss)*.

If the tests above are successful, then you have confirmed that there is basic network connectivity (based on IP address) and there is machine name resolution (based on machine name). Both of these are required to continue and for the Workpaper Manager synchronization to function successfully.

Workpaper Manager Services and Ports

Workpaper Manager uses a number of services and ports on the machines that will be connected to each other. The following illustration shows these services and technical details for each one.

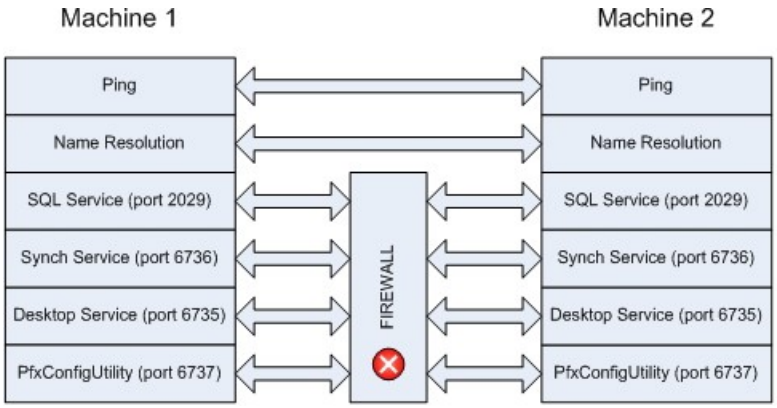


Depending on which functions are being used in Workpaper Manager, these services and ports are used at various times. For the primary function of synchronization, Workpaper Manager uses SQL Server® and the Synch Service. For these functions to work correctly, the machine must have basic connectivity as well as name resolution. Also, the machine must be able to communicate freely on the ports noted on the previous page. A port can be compared to a television channel. Even though the television may be connected to the antenna or cable, it must be tuned to receive the designated channel.

Firewalls

A firewall is used to block or allow communication on specific ports of the machine. Using the television channel analogy above, this is the equivalent of having certain channels blocked that might be considered harmful or undesirable. A firewall performs exactly the same function, keeping out certain types of network communications, while allowing other types.

If the ports needed for synchronization are blocked, this can affect how the Workpaper Manager synchronization process works. This can be caused by a firewall, an antivirus program, a client's network, or almost any other connection type that restricts the type of network traffic that can pass through. The following illustrates a network connection that will not work correctly because of a firewall block.



Testing the ports to be used by Workpaper Manager can be done with the free Port Query tool from Microsoft®. You enter the ports to be tested manually, or receive a special configuration file from Workpaper Manager support that has the proper ports already entered.

Download the Port Query tool from the following link:

http://www.microsoft.com/download/en/details.aspx?id=24009

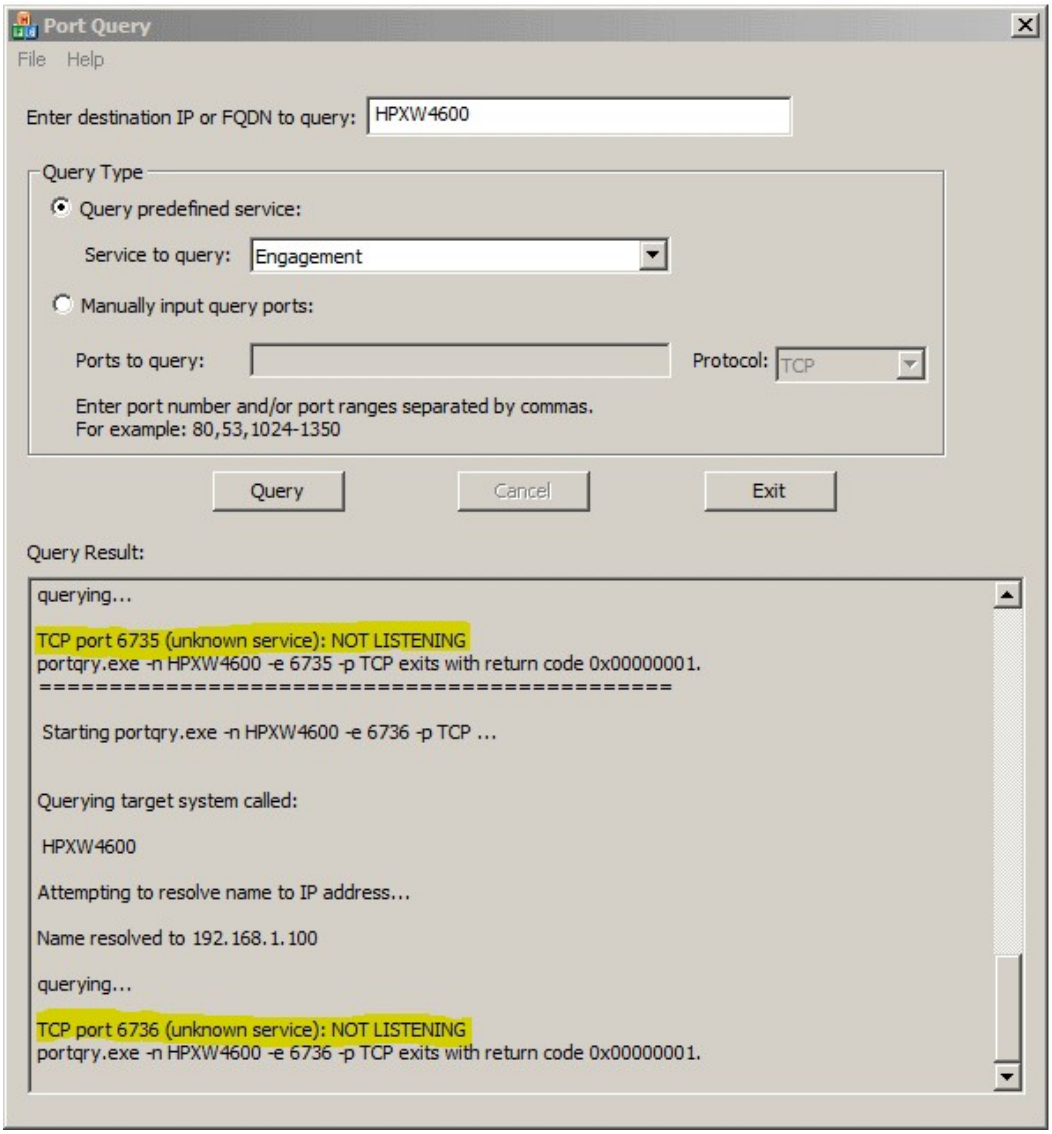
To test the Workpaper Manager ports using the PortQryUI tool, do the following:

1. Open portqueryui.exe.
2. Enter the name of the machine to be tested.
3. Do one of the following:

- Use the Engagement query predefined service. Select the **Query predefined service** option, and then select **Engagement** from the list (the config.xml will need to be edited to add Engagement and its ports as a predefined service). Each of the primary ports used with Engagement is tested, and a separate section in the results will be listed for each port.
- Manually input query ports. Select the **Manually input query ports** option, and then enter the port number and/or port ranges separated by commas.

4. Click **Query**.

For each port number, a result of LISTENING or NOT LISTENING will be reported, as shown in the following illustration. If a port is noted as NOT LISTENING, this means either the associated service is not running, or the port that it is using is blocked by a firewall of some kind.



Based on the results of the PortQryUi tool, you can continue troubleshooting to determine what is causing the ports to be blocked.

If ports are blocked, do the following:

1. Disable the Windows® Firewall on all machines.
2. Retry the Port Query test, and see if the result shows LISTENING. If so, you can successfully use Workpaper Manager only if the firewall is turned off, or if specific exceptions for those ports are added to the Windows® Firewall or other port monitoring software.

CCH ProSystem *fx* Workpaper Manager Configuration Utility

Once a network connection has been established between the machines, every user working in Workpaper Manager should run the CCH ProSystem *fx* Workpaper Manager Configuration Utility.

1. Select **Start > All Programs > CCH ProSystem *fx* Workpaper Manager > Utilities**, right-click on the CCH ProSystem *fx* Workpaper Manager Configuration Utility, and then select to **Run as Administrator**.

   Note: It may be necessary to alter the short cut for the Configuration Utility. If it fails to launch, right-click on the Configuration Utility icon and select **Properties**. The target will point to the PfxConfigUtil.exe, and there will be a /m client switch at the end. In some cases this switch has prevented the utility from launching. Remove the /m client from the end of the Target path.

2. Select the **Networking** tab of the Configuration Utility.
3. Select all check boxes in the *Delete Settings* section and click **Delete**. This removes any previous entries made by this utility that may no longer be relevant.
4. Click **Detect** in the *Auto Detect* section. It is important that every user do this step at the same time. The Detect feature broadcasts each user's machine name and IP address.
5. Once all the users machines can be seen in the Auto Detect window, click **Save**.

   Note: Pressing Save creates an SQL alias in the registry and creates entries for the workstations in the hosts file.

6. Close the Auto Detect window and close the CCH ProSystem *fx* Workpaper Manager Configuration Utility.
7. Open Workpaper Manager and select **Field** from the *Select location* list.
8. Test the ability to connect to other users. This step is not required for field synchronization.
   a. Click the **Staff** tab, right-click a user to connect to, and select **Properties**. The *Staff Location Properties* window displays.
   b. Click the **Existing location** drop-down to verify the correct machine name for the user you are connecting to.
   c. Click **OK**. The contents of the other users' Local File Room should display. This indicates

a successful connection between the two users and that field synchronizations is possible.

9. Perform a synchronization.
    a. Select a binder.
    b. Right click and select **Synchronize binder**. The Synchronize Binder Wizard guides you through the synchronization process.
    c. On the *Select a Synchronization Target* page, select a user to sync with and verify that the Existing Locations list displays the correct machine name.
    d. Click **Next** to assign workpapers or click **Finish** to complete the synchronization process.

Appendix A

DATABASE ADMINISTRATION

As an important role for the CCH ProSystem *fx* Workpaper Manager software operation, the SQL DBA will be responsible for performing a list of tasks, either on a period-by-period basis or based on requests/needs. There are two types of SQL deployment that need to be closely monitored, the Office Server and the Citrix®/Terminal Services SQL Server® both of which are SQL Servers®.

Database Backup and Health Check

One of the most important tasks for a DBA is to perform successful database backups on a regular basis.

At the very minimum, a full backup and health check should be performed on every Office Server on a daily basis. The CCH ProSystem *fx* Workpaper Manager Backup and Restore Utility helps to make this easier and includes a built-in health check feature. The SQL DBA should create a nightly task to run the CCH ProSystem *fx* Workpaper Manager Backup and Restore Utility, ideally allocating a dedicated window on the server for this task to run. The SQL DBA should be monitoring the status of this task, reviewing the log of the utility on a daily basis to make sure a successful backup was performed, and ensuring all databases remain in optimal health. For large firms, as the number of bin databases grows larger, it may take a longer time to perform full backup on a nightly basis. Therefore, you may need to monitor this closely to find out if the current window allocated for backup is sufficient for the task to run. If not, either reschedule the task for a different time when a longer window is available, or implement the differential backup option in the utility.

Important:

- Make sure to save the backup files into a different drive other than the one hosting the database .mdf and .ldf files. If the files are on the same drive, a single point of disk failure could result in the loss of both the production drive and the backups.
- Periodically check the recovery operations to validate the contents of the backup and ensure the entire environment can be restored.

Note: The Database Backup and Restore Utility does not back up any of the Terminal Services Databases.

Database Maintenance Plan

Overview

Setting up a database maintenance plan helps the SQL Server® to operate efficiently and also helps to ensure data integrity. We recommend setting up this plan to check database integrity, shrink databases, rebuild indexes, update statistics, and cleanup. For a more detailed overview of database maintenance plans, refer to the following document:

http://msdn.microsoft.com/en-us/library/ms191002.aspx#Restrictions

Agent XPs

Before creating the plan, the SQL Server® option for Agent XPs must be turned on. To turn on the SQL Server® option for Agent XPs, refer to the following document:

http://msdn.microsoft.com/en-us/library/ms178127.aspx

Database Maintenance Plan

We recommend you set up the database maintenance plan by doing the following:

1. Open **SQL Server® Management Studio.**
2. Log in to the Engagement Instance.
3. Expand the **Management** folder.
4. Right-click **Maintenance Plans.**
5. Select **Maintenance Plan Wizard.**
6. Enter **Pfx Engagement** for the plan name.
7. Leave **Single schedule for the entire plan or no schedule** selected.
8. Click **Change** to change the schedule of the task. The *Job Schedule Properties* dialog displays.
9. In the *Frequency* section, select **Monthly** from the *Occurs* drop-down menu.
10. Select **The first Sunday of every 1 month(s).**
11. Leave **Occurs once at: 12:00:00 AM** selected in the *Daily frequency* section.
12. Click **OK.**
13. Click **Next.** The *Select Maintenance Tasks* dialog displays.
14. Select the following maintenance tasks:
    a. Check Database Integrity
    b. Shrink Database
    c. Rebuild Index
    d. Update Statistics
    e. Maintenance Cleanup Task
15. Click **Next.** The tasks should be performed in the order listed in step 14.

16. Click **Next.**
17. Complete the following for the tasks selected:
    a. Database Check Integrity
        i. Select **All databases** or **Pfx Engagement databases** from the *Databases* drop-down menu.
        ii. Click **Next**.
    b. Shrink Database
        i. Select **All databases** from the *Databases* drop-down menu.
        ii. Enter **100** MB in the *Shrink databases when it grows beyond* box.
        iii. Leave 10% in the *Amount of free space to remain after shrink* box.
        iv. Select **Return freed space to operating system.**
        v. Click **Next**.
    c. Rebuild Index
        i. Select **All databases** or **Pfx Engagement databases** from the *Databases* drop-down menu.
        ii. Select **Reorganize pages with the default amount of free space** in the *Free space options* section.
        iii. Click **Next**.
    d. Update Statistics
        i. Select **All databases** or **Pfx Engagement databases** from the *Databases* drop-down menu.
        ii. Select **All existing statistics** from the *Update* options available.
        iii. Select **Full scan** as the *Scan type*.
        iv. Click **Next**.
    e. Maintenance Cleanup
        i. Select **Maintenance Plan text reports** from the *Delete files of the following type* options.
        ii. Select **Search folder and delete files based on an extension**.
        iii. Select **Browse** and browse to the The ProfxEngagement SQL Server Log file path.

            Example: C:\Program Files\Microsoft SQL Server\MSSQL10_50.PROFXENGAGEMENT\MSSQL\Log

        iv. Enter **txt** in the *File extension* box.
        v. In the *File age* section, check **Delete files based on the age of the file as task run time.**
        vi. Enter **2** and select **Months** from the drop-down menu in the *Delete files older than the following* section.
        vii. Click **Next.** The *Select Report Options* dialog displays.

18. Make your preferred report options selections.
19. Click **Next**.
20. Click **Finish** to complete the wizard.

Note: Maintenance Plans are not available in SQL Express.

CCH ProSystem *fx* Workpaper Manager Administrator Migration

Server migrations are sometimes necessary due to various reasons. The simplest approach to migration utilizes the CCH ProSystem *fx* Workpaper Manager Backup and Restore Utility. Prior to performing the migration, it is essential to take into consideration the factors mentioned here to help make the process go smoothly. Many of the recommendations mentioned take place prior to preparing for the migration and before the actual migration takes place. Missing any of these steps could result in data loss or an unsuccessful migration.

Prior to beginning the migration, it is recommended that all workpapers be checked in. It is also recommended that the installation path be the same on both the old server and the new server. For instance, if the CCH ProSystem *fx* Workpaper Manager Administrator module is installed to C:\Pfx Engagement\ on the existing server, it should be installed to C:\Pfx Engagement\ on the new server. In addition, the same version of CCH ProSystem *fx* Workpaper Manager Administrator should be installed on both servers.

The version of SQL Server® can be greater than or the same version on the target, or new server, but it cannot be less than the original server. For example, if the original server was using Microsoft® SQL Server® 2012, the new machine can use Microsoft® SQL Server® 2014, Microsoft® SQL Server® 2016, or Microsoft® SQL Server® 2017. If the old server was using SQL Server® 2016, then the new server cannot use SQL Server® 2014. In addition, you cannot upgrade from different editions. For example, you cannot upgrade from Microsoft® SQL Server® 2014 Standard to Microsoft® SQL Server® 2016 Express.

Note: You also cannot upgrade from a 32-bit instance or SQL Server to a 64-bit instance..

Migrating the Office Server

Important Notes:

- These steps only involve the migration of Administration Module. If you have other modules on your server, such as the Terminal Services Database, all binders from CCH ProSystem *fx* Workpaper Manager Terminal Services Client sessions must be checked into the Central File Room prior to migration.
- The Terminal Services Database is not included in the backup of CFR SQL databases.
- The Terminal Services Database cannot be migrated.
- The office server migration must be performed at a time when the CCH ProSystem *fx* Workpaper Manager application is not in use.
- It is required to use a full backup during a planned migration.

To migrate the office server, do the following:

1. *On the new server*, install the same version of CCH ProSystem *fx* Workpaper Manager Administrator to the same physical installation as on the old server.

   Important: Do not launch the application on the new server once installation has completed.

2. *On the old server*, open **CCH ProSystem *fx* Workpaper Manager Administrator**.
3. Locate the *Central File Room(s)* in the lower left-hand corner.
4. Right-click the **Central File Room** and select **Properties**.
5. Locate the Workpaper path and document for future reference.
6. Repeat steps 3-5 for each Central File Room.
7. Still working with the old server, run CCH ProSystem *fx* Workpaper Manager Database Backup and Restore Utility and perform a backup of the CCH ProSystem *fx* Workpaper Manager application. See How do I manually run the Backup & Restore Utility for CCH® ProSystem *fx*® Engagement or CCH® ProSystem *fx*® Workpaper Manager? for instructions on how to back up your database.

   Note: If you are on CCH ProSystem *fx* Workpaper Manager 6.5, make sure you have downloaded and used the updated CCH ProSystem *fx* Workpaper Manager Backup and Restore Utility from http://support.cch.com/updates/WorkpaperManager.

8. Disable **CCH ProSystem *fx* Workpaper Manager SQL Service (SQL Server [PROFXENGAGEMENT])** on the old server.
   a. Right-click **My Computer** and select **Manage**.
   b. Select **Services and Applications** from the navigation tree.
   c. Select **Services** in the *Services and Applications* tree.
   d. Locate the *SQL Server (PROFXENGAGEMENT)* service.
   e. Right-click the service and select **Stop**.
   f. Right-click the service again and select **Properties**.
   g. Change the startup type to **Disabled** and select **Apply**.
   h. Close the *Computer Management* dialog.
9. Copy the .bak file created with the CCH ProSystem *fx* Workpaper Manager Database Backup and Restore Utility to the new server.
10. *On the new server*, run the *CCH ProSystem fx Workpaper Manager Database Backup and Restore Utility*. Restore the .bak file you copied from the old server.
11. Copy the *Central File Room Workpaper* folder(s) from the old server to the exact same physical location on the new server.

Note: If the path is different on the new server, and you are on 6.x, you can use the CFR Workpaper Path Change executable that can be obtained from CCH ProSystem *fx* Workpaper Manager Support, or from the CCH ProSystem *fx* Workpaper Manager Install Media Image/utilities folder (available only on CCH ProSystem *fx* Workpaper Manager v6.8 and newer). See How do I use the CFR workpaper path change utility? for instructions.

12. *On the new server*, open the **CCH ProSystem *fx* Workpaper Manager Administrator** module for the first time. If the server name has been changed, you are prompted to update to the new computer name.
13. Select **Yes** to accept the name change.
14. Log into each workstation that has CCH ProSystem *fx* Workpaper Manager installed.
    a. Select **OK** on the message that displays indicating the program could not find the old server.
    b. Select **Browse** and browse to the new office server, or type in the name of the new office server.

SQL Server® Jobs

By default, the SQL Agent for CCH ProSystem *fx* Workpaper Manager SQL instance is disabled. If for any reason this needs to be turned on and some SQL tasks need to be added, it is important to make sure these SQL tasks do not have significant impact either on the run time process during the day or any nightly tasks set to run for the CCH ProSystem *fx* Workpaper Manager databases.

Database Statistics

Statistics update is essential to the performance of SQL Server®. The update of statistics is part of the bin maintenance nightly tasks. It is recommended to monitor and make sure the update step is executed successfully on a daily basis to ensure the statistics are always up-to-date.

Index Fragmentation

Index fragmentation is monitored by running the “Index Physical Statistics” report from Microsoft® SQL Management® studio. If it is determined some indexes are highly fragmented, it is recommended to perform an index rebuild or defragmentation based on the type of fragmentation during the weekend. Microsoft® explains fragmentation here.

Transaction Log File Growth

The transaction log files, also known as .ldf files, are the files that track transactions during the data modification operations. As CCH ProSystem *fx* Workpaper Manager databases are created on the SQL instances, the corresponding .ldf files are set to not grow. It is recommended to keep monitoring these files on a weekly basis to make sure they do not grow to a significantly larger size or span over the hard drives. Typically, if the size of an .ldf file is larger than 1 GB, it is an indication the truncation process is not running properly. It is recommended to manually truncate the log and shrink the log file.

Hardware Performance

It is important to know how the hardware is currently performing for CCH ProSystem *fx* Workpaper Manager operations. Since there are so many factors affecting the hardware performance, it is good practice to monitor performance of the main resources to determine if there is any bottleneck on the current hardware. Monitoring the following three areas is ideal:

- CPU
- Memory
- Disk I/O

In some cases, it is necessary to monitor network utilization and performance.

It is recommended to monitor the hardware performance on a monthly basis. It is also a best practice to monitor performance for a period of time, for instance, from morning to evening, or during peak hours of the day. The following sections include details on what to measure and the tools that are available.

Hardware Performance Indicators

CPU

Two indicators help to determine whether there is any CPU pressure:

- **% CPU time**. If CPU usage is frequently above 80%, it is an indication of CPU pressure. This is an indication that a hardware upgrade of the CPU may increase performance. To monitor this, set up a trace in Performance Monitor to capture the value in the **Processor:% Processor Time** counter by sampling the data every 10 seconds for peak hours or for the entire day.

- Number of Tasks waiting to run. This number indicates how many runnable tasks are waiting for the CPU. A frequent observation of a non-zero value of this number or a high value is an indication of a CPU bottleneck. To obtain the value, reference the result under the “runnable_ tasks_count“ column from the following query:

```
select
  scheduler_id,
  current_tasks_count,
  runnable_tasks_count
from
  sys.dm_os_schedulers
where
  scheduler_id < 255
```

To monitor this, you may write a script to run this query repeatedly every 10 seconds in Microsoft® SQL Management Studio® and save the results in a table.

This value is also available under the column “SOS_SCHEDULER_YIELD” in the Performance Dashboard report – Wait category.

Memory

The following three indicators help to determine whether there is memory pressure:

- Buffer Cache Hit Ratio. This value indicates when SQL needs to visit a particular page of data and determine how often it finds the data in the cache. If this value is frequently below 99%, this is an indication that a hardware upgrade of the memory may increase performance. This value is obtained from Performance monitor > SQL Server: **Buffer Manager** object > **Buffer Cache Hit Ratio** counter. It is also available in Performance Dashboard.
- Page Life Expectancy. This value indicates how long a page stays in memory, if it often below 300, then it indicates more memory could help to improve the performance. This value is available in Performance monitor > SQL Server: **Buffer Manager** object > **Page Life Expectancy** counter.
- Page reads/Sec. This number indicates the frequency for which the SQL Server needs to go to disk to visit a desired page data. If this value goes above 80, it is an indication of memory pressure. This number is obtained from Performance monitor > SQL Server: **Buffer Manager** object > **Page reads/Sec** counter.

To monitor the memory pressure, simply add the above counters to the same task as stated above with the CPU Counters.

Disk I/O

The following three indicators help to determine the health of disk I/O:

- Ave Disk Sec/Read. This value indicates how long it takes to fulfill one read request by the hard drive. The ideal value is 0.005 second. A value under 0.010 second is also acceptable. However, if it is frequent to see more than 0.010 second in this counter, it is an indication the hard drive throughput is not sufficient. This value is available in **Performance Monitor > PhysicalDisk Object > Ave Disk Sec/Read** counter. The overall statistics values are also available in Performance Dashboard.
- Ave Disk Sec/Write. This value indicates how long it takes to fulfill one write request by the hard drive. The ideal value is 0.005 second. A value under 0.010 second is also acceptable. However, if it is frequent to see more than 0.010 second in this counter, it is an indication the hard drive throughput is not sufficient. This value is available in **Performance Monitor > PhysicalDisk Object > Ave Disk Sec/Write** counter. The overall statistics values are also available in Performance Dashboard.
- Ave Disk Queue Length. This value indicates how many tasks are waiting for the hard drive to perform a disk I/O. A frequent observation of values higher than 1 is an indication of I/O pressure. This value is available as a counter in **Performance Monitor > PhysicalDisk Object > Avg. Disk Queue Length**. The overall statistics values are also available in Performance Dashboard.

To monitor the disk I/O, simply add the above counters to the same task as stated above with the CPU Counters.

Tools Available for Hardware Performance Monitoring

Performance Monitor

This tool is ideal for contiguous monitoring of resources for a period of time, for instance, during peak hours or for an entire day of operations. Since scheduled tasks are used to collect data on an interval basis, the performance monitor helps to provide the SQL DBA a good indication of how the hardware resources are utilized. All the desired indicators are available as counters under different categories.

Performance Dashboard Reports for SQL Server®

This tool provides a quick overview on performance-related facts for the current moment. It requires no set up and is easy to use. It is useful to help diagnose a known performance issue on the SQL server® and help to analyze the hardware performance bottleneck for a given moment. It will also provide data to help analyze software bottlenecks, such as blocking.

Troubleshooting Performance Issues

To diagnose a known performance issue, do the following:

1. Try to reproduce the issue. If the issue is reproduced, as the process is run on the user's machine, launch the performance Dashboard report from SQL management studio.
2. Detect if there is any CPU bottleneck.
3. Detect if there is any memory pressure present.
4. Detect if there is any disk I/O bottleneck.
5. Detect if there is any blocking present – either software or hardware.
6. Document any findings. If it is determined there are hardware-related issues, upgrade the corresponding resource, if possible; otherwise, contact CCH ProSystem *fx* Workpaper Manager support for more help.

SQL Server® (x64) vs. SQL Server® (x86) with AWE Enabled

A 64-bit server operating system is recommended for use in conjunction with the 64-bit editions of either Microsoft® SQL Server® Standard Edition or Enterprise Edition. This combination can fully utilize available RAM on the server, and in the event that more RAM is added, 64-bit editions of Microsoft® SQL Server®, Windows Server® 2012, Windows Server® 2016, and Windows Server® 2019 operating systems will take full advantage of the additional resources. Microsoft® SQL Server (x86) only supports 2 GB of RAM by default. This is due to a limit of 4 GB of virtual address space of SQL Server® (x86).

If for any reason, there is a constraint preventing the use of Microsoft® SQL Server® (x64), it is still possible for Microsoft® SQL Server® (x86) to utilize more than 2 GB of RAM by enabling the AWE option. However, the maximum RAM SQL utilizes with AWE enabled depends on how much memory is supported by the corresponding operating system that is running SQL Server®.

SQL Server® Editions

Consider the following factors when choosing a SQL Server® edition:

- SQL instance on Office Server vs. SQL Instance Citrix® Server®
- Number of concurrent users
- Overall data volume on the SQL server®
- Number of processors to support

Other factors to consider:

- Capability of online re-indexing
- Performance with parallel processing features

SQL Server® Express Edition

Due to the limit on RAM (1 GB) and CPU (1 Processor), this edition is not appropriate for a Terminal Services environment.

SQL Server® Standard Edition vs. Enterprise Edition

Microsoft® SQL Server® Standard Edition and Enterprise Edition can take full advantage of the RAM available to the corresponding operating system. However, Standard Edition only supports up to 4 processors. The necessity of the Enterprise Edition of Microsoft® SQL Server® is determined by the number of processors installed in the SQL Server®. If it is determined more than 4 processors are necessary for a particular environment, Enterprise Edition is the only option for the server. Determining whether additional processors are necessary is accomplished by monitoring resource usage on the current hardware configuration and then deciding whether additional processors would improve the performance of the server. For more details on this topic, see *Hardware Performance Indicators* on page 43 in this appendix.

CCH ProSystem *fx* Workpaper Manager databases do not fully leverage the capabilities of the Enterprise Edition of Microsoft® SQL Server®, but additional features in this edition such as online re-indexing and parallel processing capability will improve performance over a sustained period of time. Please consider these factors when choosing between SQL editions.

For a detailed comparison between the available editions of Microsoft® SQL Server®, please refer to the following document link:

http://www.microsoft.com/sqlserver/en/us/editions.aspx

Appendix B

UPGRADING CCH PROSYSTEM FX WORKPAPER MANAGER

The purpose of this section is to provide an overview of the steps necessary to ensure an upgrade to the latest version of Workpaper Manager completes successfully.

Before the Installation

1. Review the contents of this guide for the most recent version of Workpaper Manager. Each version of the program has very specific requirements which should be followed to ensure optimal performance.
2. Review the Release Notes and the knowledge base article Installation Guidance for CCH® ProSystem fx® Engagement or CCH® ProSystem fx® Workpaper Manager for important information regarding the latest version of Workpaper Manager. This information includes the latest supported service packs and software.
3. Synchronize all Binders to the Central File Room. You are not required to check workpapers in for an upgrade. However, synchronizing all binders provides a backup and fallback plan for each machine in case an upgrade fails for some reason.
4. Manually perform a backup of all Office Servers using the CCH ProSystem *fx* Workpaper Manager Backup and Restore Utility.
5. Back up all template types (binder, trial balance grouping, and workpaper) on each Office Server.

   Note: Backing up template types is especially important if the templates are stored on a network location accessible by all users in the firm.

6. Ensure all prerequisites required by the CCH ProSystem *fx* Workpaper Manager Installer are installed. Refer to the knowledge base article Installation Guidance for CCH® ProSystem fx® Engagement or CCH® ProSystem fx® Workpaper Manager for more details.

Upgrading the Office Servers

1. Microsoft® SQL Server® requires that all folders containing SQL databases not be compressed. Before performing the upgrade on each Office Server, it is recommended to check for compressed folders and decompress them if found. The Compressed Database Utility, located

on the CCH ProSystem *fx* Workpaper Manager Install Media, can be used to check for compressed databases.

2. Disable virus scanning software on each Office Server.
3. Begin the upgrade process on the Main Office Server.
4. If the logon credentials were previously changed for PFXSYNPFTService to allow for a CFR location on the network, these logon credentials will need to be reset.
5. Verify all scheduled tasks, including the backup and restore, still function correctly.
6. Verify the permissions on the Admin Share folder are set to allow administrative users full control.
7. Repeat these steps until all Office Servers are upgraded.

   Note: After upgrading versions of Workpaper Manager, it may be necessary to install the latest Tax Grouping Update Wizard.

Upgrading Workstations Using Active Directory®

Note: If the firm is not using the Active Directory® method of pushing the update to all machines, see the next section, *Manually Installing the Workstations*.

1. Microsoft® SQL Server® requires that all folders containing SQL databases not be compressed. It is recommended to check for compressed folders and decompress them if found.
2. Upgrade Workpaper Manager by publishing the update. Refer to the knowledge base article Installation Guidance for CCH® ProSystem fx® Engagement or CCH® ProSystem fx® Workpaper Manager for more details.

   Note: After upgrading versions of Workpaper Manager, it may be necessary to install the latest Tax Grouping Update Wizard.

Manually Installing the Workstations

1. Microsoft® SQL Server® requires that all folders containing SQL databases not be compressed. It is recommended to check for compressed folders and decompress them if found.
2. If the user is in the field and a synch was not performed with the Office Server, binder packages should be taken of all binders.
3. Close Microsoft® Word, Excel®, and Outlook®.
4. Close any additional programs.
5. Disable virus scanning software.
6. Upgrade Workpaper Manager.

   Note: After upgrading versions of Workpaper Manager, it may be necessary to install the latest Tax Grouping Update Wizard.

Appendix C

Installing CCH ProSystem fx Workpaper Manager on a SQL Cluster

This section is a reference to the steps necessary to install Workpaper Manager on a SQL Cluster. Two modules are supported on the SQL Cluster, the CCH ProSystem *fx* Workpaper Manager Administrator and Terminal Services modules. Both modules can be installed on the same cluster or they can be installed individually.

Before Beginning the Installation

1. Review the contents of this guide for optimal configuration.
2. Review the Release Notes and the knowledge base article Installation Guidance for CCH® ProSystem fx® Engagement or CCH® ProSystem fx® Workpaper Manager for important information regarding the latest version of Workpaper Manager. This information includes the latest supported service packs and software.
3. Synchronize all binders to the CFR and check in workpapers during this process.
4. Manually perform backups of all office servers. This includes the SQL Databases and the workpapers.

Installing the Administrator Module

1. The Microsoft® Windows Server® Cluster should be installed and configured.
2. Microsoft® SQL Server 2019, SQL Server® 2017, SQL Server® 2016, or SQL Server® 2014 should be installed as a failover instance to the cluster.
3. Set the preferred owner of the SQL Instance to the node currently logged into for installation.
4. Set the Failover property of the SQL server® to "Allow failback immediately."
5. Create the Task Scheduler resource as a generic service.
6. Ensure the SQL Agent cluster resource is offline.

   Note: If the SQL Agent is not offline, you may receive error messages and may not be able to complete the install. Refer to *Chapter 4: Deployment Planning - SQL Server Agent* on page 24 for more information.

7. Open an Elevated Command Prompt.

8. Run the msiexec with command line with parameters for
   - ADMIN_CLUSTER="1"
   - CLUSTERDIR="DRIVE FOR SQL"

   Example: msiexec /i "C:\CCH ProSystem fx Workpaper Manager.MSI" ADMIN_CLUSTER="1" CLUSTERDIR="G:\PFXEngagementData\" ENGSQLCLUSTER=ENGAGEMENTSQL

   If this is an upgrade, add parameter
   - CLUSTERUPGRADE = “1”

   Example: msiexec /i "C:\CCH ProSystem fx Workpaper Manager.MSI" ADMIN_CLUSTER="1" CLUSTERDIR="G:\PFXEngagementData\" ENGSQLCLUSTER=ENGAGEMENTSQL CLUSTERUPGRADE = “1”

9. Select the Admin Feature.
10. Complete the Installation.
11. Set share permissions in a way that administrative users using the CCH ProSystem *fx* Workpaper Manager Administrator have write access to the x:\PfxEngagementData\Admin Share.

    Note: Failure to perform these steps can result in impaired functionality in the Administrator.

12. Fail-over to the next node.
    a. Repeat Steps 1 - 10.
13. Open Server Manager.
14. Go into the Failover Cluster Manager.
15. Create the following resources as generic services:
    a. PfxEngDesktopService
    b. PfxSynPftService
16. Copy the backup files of the office servers you created to the cluster. Refer to Step 4 in *Before Beginning the Installation* on the previous page.
17. Launch the CCH ProSystem *fx* Workpaper Manager Backup and Restore Utility.
18. Perform a Full Restore using the backup files copied in Step 16.

Installing the Terminal Services Database Module

1. The Microsoft® Windows Server® Cluster should be installed and configured.
2. Microsoft® SQL Server 2019, SQL Server® 2017, SQL Server® 2016, or SQL Server® 2014 should be installed as a failover instance to the cluster.
3. Set the preferred owner of the SQL Instance to the node currently logged into for installation.
4. Set the Failover property of the SQL server® to "Allow failback immediately."

5. Create the Task Scheduler resource as a generic service.
6. Ensure the SQL Agent cluster resource is offline.

   Note: If the SQL Agent is not offline, you may receive error messages and may not be able to complete the install. Refer to *Chapter 4: Deployment Planning - SQL Server Agent* on page 24 for more information.

7. Open an Elevated Command Prompt.
8. Run the msiexec with command line with parameters for
   - TSDB_CLUSTER ="1"
   - CLUSTERDIR="DRIVE FOR SQL"

   Example: msiexec /i "C:\CCH ProSystem fx Workpaper Manager.MSI" TSDB_ CLUSTER="1" CLUSTERDIR="G:\PFXEngagementData\" ENGSQLCLUSTER=ENGAGEMENTSQL

9. Select the Terminal Services Database Module.
10. Complete the Installation.
11. Set share permissions in a way that users using the CCH ProSystem *fx* Workpaper Manager Terminal Services Client have write access to the x:\PfxEngagementData\WM\Workpapers share on the cluster.

    Note: Failure to perform these steps can result in impaired functionality in the Terminal Services Client.

12. Fail-over to the next node.
    a. Repeat Steps 1 - 10.
13. Open Server Manager.
14. Got into the Failover Cluster Manager.
15. Create the following resources as generic services.
    a. PfxEngDesktopService
    b. PfxSynPftService

Installing the Administrator and Terminal Services Database Module Together

1. The Microsoft® Windows Server® Cluster should be installed and configured.
2. Microsoft® SQL Server 2019, SQL Server® 2017, SQL Server® 2016, or SQL Server® 2014 should be installed as a failover instance to the cluster.
3. Set the preferred owner of the SQL Instance to the node currently logged into for installation.
4. Set the Failover property of the SQL server® to Allow failback immediately.
5. Create the Task Scheduler resource as a generic service.

6. Ensure the SQL Agent cluster resource is offline.

   Note: If the SQL Agent is not offline, you may receive error messages and may not be able to complete the install. Refer to *Chapter 4: Deployment Planning - SQL Server Agent* on page 24 for more information.

7. Open an Elevated Command Prompt.
8. Run the msiexec with command line with parameters for:
   - ADMIN_CLUSTER="1"
   - TSDB_CLUSTER="1"
   - CLUSTERDIR="DRIVE FOR SQL"

   Example: msiexec /i "C:\CCH ProSystem fx Workpaper Manager.MSI" ADMIN_CLUSTER="1" TSDB_CLUSTER="1" CLUSTERDIR="G:\PFXEngagementData\" ENGSQLCLUSTER=ENGAGEMENTSQL

9. Select the Admin and Terminal Services Database Modules
10. Complete the Installation.
11. Fail-over to the next node.
    a. Repeat Steps 1 - 10.
12. Open Server Manager.
13. Go into the Failover Cluster Manager.
14. Create the following resources as generic services.
    a. PfxEngDesktopService
    b. PfxSynPftService
15. Copy the backup files of the office servers you created to the cluster. Refer to Step 4 in *Before Beginning the Installation* on page 50.
16. Set share permissions in a way that users using the CCH ProSystem *fx* Workpaper Manager Administrator have write access to:
    - Administrative users. "x:\PfxEngagementData\Admin" share on the cluster.
    - All users. "x:\PfxEngagementData\WM\Workpapers" on the cluster.

    Note: Failure to perform these steps can result in impaired functionality in the Administrator and in the ability for users to login from Terminal Services Client.

17. Launch the CCH ProSystem *fx* Workpaper Manager Backup and Restore Utility
18. Perform a Full Restore using the backup files copied in Step 15.

Performing a Repair of CCH ProSystem *fx* Workpaper Manager on a SQL Cluster

Performing a repair of CCH ProSystem *fx* Workpaper Manager on the SQL Cluster is not supported. You must uninstall and reinstall CCH ProSystem *fx* Workpaper Manager on the cluster following the installation instructions in this appendix.

Performing a Modify of CCH ProSystem *fx* Workpaper Manager on a SQL Cluster

To perform a modify installation on the cluster, run a command via the command line with MsiExec.exe. Performing a modify installation from the Windows® UI will not be allowed. The following command should be used:

MSIEXEC /i <path to msi> ADDLOCAL=CLUSTER_ADMIN,CLUSTER_TSDB,ADMIN,TSDATABASE ADMIN_CLUSTER="1" TSDB_CLUSTER="1" CLUSTERDIR=<Directory on the cluster to install> ENGSQLCLUSTER=<name of the sql cluster> /PASSIVE

Example: MSIEXEC /i "C:\CCH ProSystem fx Workpaper Manager.MSI" ADDLOCAL=CLUSTER_ADMIN,CLUSTER_TSDB,ADMIN,TSDATABASE,CDIMAGE ADMIN_CLUSTER="1" TSDB_CLUSTER="1" CLUSTERDIR="G:\PFX ENGAGEMENT DATA" ENGSQLCLUSTER=SQL2012ENG /PASSIVE

Uninstalling CCH ProSystem *fx* Workpaper Manager on a SQL Cluster

To uninstall CCH ProSystem *fx* Workpaper Manager on a SQL Cluster, do the following:

1. Close all programs on your computer.
2. Select **Programs and Features** from your computer's Control Panel.
3. Select **CCH ProSystem *fx* Workpaper Manager** from the list and click **Remove** to display the *Welcome* dialog.
4. Click **Yes** on the confirmation dialog.

Appendix D

Additional Resources

Additional resources that will help with the evaluation and deployment of CCH ProSystem *fx* Workpaper Manager:

CCH ProSystem *fx* Workpaper Manager Documentation

- Installation Guidance for CCH® ProSystem fx® Engagement or or CCH® ProSystem fx® Workpaper Manager
- CCH ProSystem *fx* Workpaper Manager Customer Support

Training

- Training and Consulting

Microsoft®

- Terminal Services Deployment Guide
- Product Life Cycle
- Infrastructure Planning and Design - SQL Server®
- Infrastructure Planning and Design - Terminal Services
- Microsoft® SQL Server® Edition Comparison
- SQL Clustering with 2014
- SQL Clustering with 2016
- SQL Clustering with 2017
- SQL Clustering with 2019