Infrastructure Requirements

Warranted environment specifications for TPP products

Please note: All patient data shown in this document is fictitious.

Document History

Version	Date	Performed By	Approved By	Description
1.0	26/06/2014	Phil Grayson	N/A	Creation
1.1	31/07/2014	Sven Lowry	N/A	Updated with current VDI status and country specific WAN requirements
1.2	18/09/2015	Paul Wye/Anne-Laure Mahe-Cook	N/A	Added to section 2.3 regarding updating drivers
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1.4	18/08/2016	James Powell	N/A	Added minimum requirements for Gateway to section 2.6.1
1.5	10/08/2020	Samuel Claxton	Ben Gausden	Updated Minimum Spec and added Mobile Devices Section
1.6	26/08/2020	Ben Gausden	Samuel Claxton	Added information about Multicasting in section 3.1 and clarified that the memory allocation for SystmOne is per instance in sections 2.6.1 & 2.6.3
1.7	23/02/2020	Lucy Young	Ben Gausden	Updated Mobile Devices Section
1.8	02/08/2021	Sam Claxton	Mathew Hatfield	Updated Minimum Spec
1.9	01/03/2022	Elenor Sims	Thomas Rolfe	Updated Mobile Devices Section
2.0	23/01/2025	Brodie Peberdy	Samuel Claxton	Updated Antivirus Software Section
2.1	24/04/2025	Kate Lawrence	Samuel Claxton	Updated section about Multicasting

Confidentiality

All information contained in this document is confidential between you and The Phoenix Partnership (Leeds) Ltd.

Glossary

Abbreviation	Primary
IE	Internet Explorer
IP	Internet Protocol
IT	Information Technology
LAN	Local Area Network
MS	Microsoft
OS	Operating System
QoS	Quality of Service
SMS	GSM Short Message Service
SSL	Secure Socket Layer

TCP	Transmission Control Protocol
TPP	The Phoenix Partnership
URL	Uniform Resource Locator
USB	Universal Serial Bus
VDI	Virtual Desktop Infrastructure
VPN	Virtual Private Network

Contents

1 Introduction

1.1 Objectives

This document outlines the requirements for a warranted environment within which TPP can efficiently deliver your service. This document is not a specification for procurement.

Given the nature of our industry, the requirements of SystmOne and its dependencies may change over time and this document will be updated to reflect these changes.

Legal Disclaimer: Neither the document as a whole, nor portions of the document copied verbatim, may be used in the process of procuring equipment, as references to specific manufacturers in the procurement process is illegal.

1.2 Scope

This document covers the following areas:

- End-user workstation requirements
- Peripherals such as printers and call boards
- Networking requirements and configuration information

1.3 Limit of Liability

Throughout this document, the term “warranted” means that TPP will attempt to rectify problems associated with its service in such an environment, whereas “supported” means that TPP’s service does not preclude such an environment. Therefore, all “warranted” are “supported” but **not** vice versa.

Using equipment, software or configurations that are not warranted within this document or workstations or other infrastructure outside the manufacturer’s specifications may affect the ability of TPP to deliver the service effectively. This ICT infrastructure specification is provided on the basis that:

- Warranting the environment does not mean TPP will be held liable for events caused by your operated infrastructure or incidents/problems outside the control of TPP.
- You are responsible for the installation of all client components and the overall acceptable performance of all applications on the users’ PC. TPP are only responsible for issues relating to the SystmOne solution.

1.4 Amendments

TPP may update this document at any time. Please contact TPP for the latest version.

2 SystmOne Requirements

2.1 Software Agreements

TPP are not responsible for 3rd party software agreements such as Microsoft Windows or Office. Likewise, TPP are not responsible for any client access licences required to access SystmOne servers.

2.2 Software Requirements

Applications able to open / view rich text (.rtf) and comma separated (.csv) files will provide limited functionality. For integration and document generation from SystmOne, Microsoft Word is required.

2.3 Supported Software

Any third party software that integrates with, or is a prerequisite of TPP software will only be supported whilst supported by the manufacturer. E.g. at the time of writing, Windows 8.1 will no longer be supported by Microsoft, and therefore TPP, from January 2023.

All major releases of existing software will be subject to strict testing by TPP and therefore new versions of currently supported software will not automatically become supported.

Microsoft Support Lifecycle Product Database

https://docs.microsoft.com/en-us/lifecycle/products/

TPP recommend that third party software is maintained and updated as per the manufacturers' guidelines.

You must ensure all drivers for all devices and peripherals, such as printers, are kept up to date according to the manufacturers' recommendations.

2.4 Operating Systems

TPP supports all 64-bit versions of Windows for desktops that are currently supported by Microsoft. This includes those where extended support has been purchased.

Following verification of the configuration by TPP, installation of Windows to a virtual environment is supported to the products and versions detailed in section 2.8 Virtual Environments.

Installation of the SystmOne client to any Server Operating System is not licensed by TPP.

32-bit versions of Microsoft Windows and Windows RT are not supported.

2.5 Antivirus Software

TPP expect antivirus software to be installed and maintained on all warranted environments. Where possible, antivirus programs should be configured to trust SystmOne servers and files with the exception of any subdirectories contained within the "C:\Apps\Tpp\temp\" directory prefixed with "tmpImages".

2.6 System Requirements

2.6.1 SystmOne System Requirements

The individual specifications of all software should be taken into account when procuring or upgrading hardware.

CPU	1 gigahertz (GHz) or faster 64-bit (x64) processor
RAM	1 GB dedicated to each instance of SystmOne. TPP Recommend 2 GB of RAM dedicated to each instance SystmOne.
Hard disk space	4 GB of free space on the C drive* *Where a SystmOne Gateway client is used, 100 GB of free space on the C drive is recommended
System Drive	The OS system drive must have a drive letter of C
Screen Resolution	A minimum screen resolution of 1024 x 768 pixels with 16-bit colours (High Colour) is required. TPP recommends a minimum of a 17" TFT flat screen monitor with a resolution of 1280 x 1024 and 32-bit colours (True Colour).

2.6.2 Mobile Working System Requirements

The individual specifications of all software should be taken into account when procuring or upgrading hardware.

CPU	1 gigahertz (GHz) or faster 64-bit (x64) processor
RAM	1 GB dedicated to SystmOne.
Hard disk space	4 GB of free space on the C drive
System Drive	The OS system drive must have a drive letter of C
Screen Resolution	A minimum screen resolution of 1024 x 720 pixels.
Connectivity	Mobile Internet access via 3G, 4G or Wi-Fi.

2.6.3 Calculating Memory Requirements

The total amount of memory required should take into consideration the minimum requirements specified for the operating system and any other 3rd party software to be installed and running while SystmOne is also running (e.g. Microsoft Office).

Windows 10 64-bit	2 GB
Office 2019	4 GB
Avast Anti-Virus	1 GB
SystmOne	1 GB (for a single instance of SystmOne)
Total	**8 GB RAM**

Note: *Other third party applications, shared graphics or peripherals (such as attached printers) should be taken into account as these will all increase the amount of memory available for the computer to run smoothly. Please also note that 64-bit versions of windows and any later versions of office require significantly more memory. Exact minimum requirements for these products can be found on Microsoft's website. The values used above are representative of a potential system and are by no means a recommendation.*

2.6.4 Mobile Device System Requirements

Android: Android 6 or later is required. This requirement may change over time as old versions are no longer supported by Google.

We recommend using a device with at least 4GB of RAM. (The Android OS limits how much memory each app can use out of the total RAM and this limit further varies by device and manufacturer. Having at least 4GB of RAM should ensure the per-application limit is sufficient to run TPP's apps).

iOS: iOS 13 or later is required. This requirement may change over time as old versions are no longer supported by Apple.

2.7 Peripherals

2.7.1 Printers

Printers certified for the version of Microsoft Windows in use are compatible with TPP applications. TPP recommended that all printers are tested fully before bulk purchases are made.

2.7.2 Scanners

Scanners certified for the version of Microsoft Windows in use are compatible with TPP applications. TPP recommended that all scanners are tested fully before bulk purchases are made.

2.7.3 Call Boards

The SystmOne solution incorporates local patient call boards. The following table describes the call waiting boards that have been tested by TPP. TPP warrants callboard functionality for these products.

Manufacturer	Model	Notes
Jayex	PCD300804DR (D300/4)	Dual Line Display Board
Jayex	LCD Digital Signage	
Polycomp	Display Board	
Numed	Envisage	
TPP	SystmOne	SystmOne includes built-in call functionality free of charge

2.8 Virtual Environments

Virtual desktop infrastructure (VDI) is complex and requires specialist configuration to be compatible with SystmOne. Incorrectly configured solutions will result in performance issues and may create a clinical hazard.

Although you will be able to use VDI solutions and SystmOne on development and migration environments, you will be unable to do so on production SystmOne environments, without first contacting TPP.

SystmOne is currently supported for use in warranted Operating Systems (section 2.4) hosted using the following VDI software (note that these are the minimum versions required.):

- Virtual VMware View 5+
- Citrix Xen Desktop 6+
- Microsoft Server 2012+ (Virtual Desktop Infrastructure (VDI) deployment)

3 Networking

3.1 Local Area Networks

Computers utilising fixed Ethernet connections should not experience any issues with local network performance. TPP recommended that static computers are connected using this method. Gigabit Ethernet is also recommended.

Multicasting must be enabled between clients at a given organisation. This is required to ensure clients share caches which prevents them from generating excessive WAN traffic. Multicasting is a basic network concept and is typically enabled by default across LAN network devices. Organisations must ensure that all intermediate network devices, such as routers and switches, are capable of supporting multicast traffic. On devices without multicast support, certain functionally may fail to operate correctly, experience intermittent issues, or cause performance delays.

3.2 Wireless LAN technologies

Wi-Fi networks are not recommended for static computers but TPP appreciate that wired connections are not always viable for mobile or temporary computers and tablets. IT teams must ensure that wireless LAN implementations are suitably sized, have sufficient coverage and are free from interference.

TPP recommended that Wi-Fi networks are professionally installed and sites are fully surveyed before and after installations, checking for dead spots and interference. TPP also recommend periodic checks of the network as neighbouring Wi-Fi networks or other ISM band devices can interfere with performance.

Large deployments should ensure that the wireless infrastructure supports seamless roaming between access points.

3.3 WAN Connections

A Wide Area Network (WAN) connection is required to connect to the SystmOne servers.

Country specific WAN requirements are provided in a supplementary document.

TPP recommend the use of fixed, low latency broadband connections as the primary connections. Ideally, backup connections would also be fixed, low latency connections supplied via another service provider and / or an alternative technology.

Failover of primary lines to backup lines should be automatic, as should the failback once the fault has been removed.

3.3.1 Fixed Broadband Connections

TPP SystmOne is a highly tuned application and extremely light on network usage. Periodically, large amounts of data will need to be downloaded and therefore TPP recommend that primary network connections are no lower than 512 Kbps with backup connections being no lower than 256 Kbps.

For fixed connections with over 8 users, TPP recommend that the network connections are calculated based on the number of SystmOne clients. Allowing 64 Kbps per user for primary connections and 32 Kbps per user for backup connections.

SystmOne Users	Primary	Backup
<8	512 Kbps	256 Kbps
10	640 Kbps	320 Kbps
20	1.3 Mbps	640 Kbps
50	3.2 Mbps	1.6 Mbps

100	6.4 Mbps	3.2 Mbps

3.3.2 Wireless Broadband Connections

There are no clear-cut rules for defining which wireless broadband technology to adopt for either primary or backup connections. Although the bandwidth requirements for SystmOne are low, poor network performance is usually attributed to high latency rather than low bandwidth. With this in mind, we recommend that more bandwidth is allocated per user as the latency of the line increases.

Below are examples of how SystmOne performs over a variety of connections. Please note how the higher bandwidth satellite BGAN connection performs better than the lower latency GPRS connection.

	1 GbE	Wi-Fi	3G	BGAN	GPRS
Bandwidth	1 Gbps	16 Mbps	2.8 Mbps	250 Kbps	114 Kbps
Latency	8 ms	10 ms	265 ms	867 ms	652 ms
Patient Retrieval	0.07 sec	0.14 sec	0.58 sec	1.86 sec	2.60 sec

3.4 Quality of Service (QoS)

Quality of Service (QoS) should be configured to prioritise SystmOne traffic over all other traffic types, with the exception of IP telephony traffic. Effective QoS templates are essential to the correct running of SystmOne. It is important that all local routers are configured correctly and all QoS templates are updated regularly to incorporate any changes to the system.

Ideally ISPs will provide end-to-end QoS for SystmOne traffic although TPP appreciate that this is often difficult and will provide technical assistance where possible.

3.5 Ports and Protocols

SystmOne communicates over both TCP & UDP protocols as detailed below.

TPP Service	Service Name	Protocol	Port Range
SystmOne	SystmOne TCP	TCP	2130-2140
SystmOnline	HTTPS	TCP	443
Mobile Working	HTTPS	TCP	443
SystmOne	SystmOne UDP	UDP	2120-2130
All	Ping	ICMP	Echo Request

3.6 Server IP / DNS Information

The IP addresses for TPP central servers are country / region specific. This information is supplied as a project specific addition to this document.

3.7 Proxy Servers

TPP strongly recommends against the use of proxy servers as this can have a detrimental impact on performance and increases the risk of legitimate traffic being incorrectly identified and rejected.

3.8 Source IP Considerations

Traffic originating from suspicious sources such as public proxy servers, blacklisted IP addresses or from IP ranges registered outside of the region / country are likely to be denied access to the central servers.

3.9 IPv6 Support

To date, there has not been a request or a requirement for TPP to support IPv6 and therefore IPv6 remains untested and unsupported.