

# RamSoft Platform Specifications

## Version 6.0



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**MANUFACTURER**

RamSoft Incorporated  
700-60 Adelaide St E  
Toronto, ON M5C 3E4  
CANADA

**Toll Free:** (888) 343-9146  
**Phone:** (416) 674-1347  
**Fax:** (416) 674-7147  
**Email:** [support@ramsoft.com](mailto:support@ramsoft.com)  
**Web Site:** <http://www.ramsoft.com>

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# 1 EXECUTIVE SUMMARY

The purpose of this document is to provide the best hardware and software specifications for various RamSoft products.

Please be aware that requirements are subject to change without notice.

## 1.1 Classification of Products

The products in this document are covered under the broad categories of PowerServer & PowerServer Lite, PowerServer RIS/PACS, Routers & Gateways, PowerCache, Scheduler/Tech/Transcriptionist Workstations and Radiologist Workstations.

The products are further differentiated into five categories by the total number of studies they will handle i.e. Less than 15K, Less than 30K, Between 30K-100K, Between 100K–200K and more than 200K.

## 1.2 Classification of Supported Platforms

RamSoft Products	Microsoft Windows						Internet Explorer v11+	Chrome V48+	Safari V7+	Microsoft Word (32-bit or 64-bit)			iPad	Galaxy Tab	Surface Pro
	7	8.1	10	2008 R2	2012 R2	2016				2010	2013	2016			
PowerServer				X	X	X									
Essence	X	X	X	X	X	X	X	X	X				X	X	X
RapidResults	X	X	X	X	X	X	X	X	X				X	X	X
Gateway	X	X	X	X	X	X				X	X	X			X
Gateway Router/Router Lease	X	X	X	X	X	X									
Local Cache/Power Cache	X	X	X	X	X	X	X								X
PowerReader	X	X	X	X	X	X	X			X	X	X			X
Mirth HL7	X	X	X	X	X	X									

PowerServer and Essences support Standard edition (or higher) of MS Windows Server 2008 R2, MS Windows Server 2012 R2, and MS Windows Server 2016.

Gateway, Gateway Router, Gateway Router Lease, Mirth HL7, and PowerCache only support Windows Professional Editions. PowerReader and PowerCache support all platforms above and including Windows 7.

Running PowerReader on the server side (or on a Terminal Server) is only supported on Windows Server 2008 R2, Windows Server 2012 R2, and Windows 2016 operating systems.

RapidResults supports all Windows Editions including Windows XP (using Chrome) and Vista (using Chrome).

Mirth HL7 and Essence require Java Runtime Environment (JRE) 8, 64-bit edition.

Vidar Film Digitizer is only supported in PowerReader 32-bit. CD Viewer supports all Windows Editions including XP and Vista.

### 1.3 User Requirements

All of our specifications require dedicated servers to run the RamSoft application and not for any other purpose i.e. Domain Controller, File Server, Mail Server etc.

All PowerServer RIS/PACS installations must have redundant servers. Redundant servers have the same specifications as primary servers.

Non-RIS customers can use a Network Attached Storage (NAS) along with a file replication application to serve as an image-only backup.

Server with many concurrent users or receive many prior studies would need to exceed the recommended specification.

### 1.4 Technical Support

Technical support is provided to end-users by System Integrators and the RamSoft Support Team. The RamSoft Support Team is reachable through [www.ramsoft.com](http://www.ramsoft.com), 888-343-9146 and +1-416-674-1347.

## 1.5 Workstation Peripherals

### Workstation Peripherals (Optional)

Type Of Peripheral	Supported Devices/Models
RapidKeys	<u>RamSoft RapidKeys</u>
Dictation Microphones	<u>Philips SpeechMike</u> :LFH-3000, LFH-3010, LFH-3200, LFH-3210, LFH-3300, LFH-3310, LFH-5274, LFH-5276, LFH-5262, LFH-5272, LFH-5282, LFH-5284
	<u>Nuance</u> : PowerMic II
Transcription Foot Pedals	<u>Philips</u> : LFH-2310
	<u>Infinity</u> : IN-USB2
Scanners	Any WIA Compliant Scanner
CD Printers	<u>Primera</u> : Bravo SE Disc Publisher
Label Printers	<u>DYMO</u> : LabelWriter 450
Barcode Scanners	<u>Metrologic</u> : VoyagerCS MS9540
Film Digitizer	Any Vidar Film Digitizer
Voice Recognition Software	Dragon Medical Practice Edition 1.x, 2.x, 4.x M*Modal Speech Understanding™

### RIS Workstation Peripherals (Optional)

Type Of Peripheral	Supported Devices/Models
Signature Pads	IDGem 1x5 Backlit RF
Tablet Displays	Any Windows 10+ Touch Display

## 2 POWERSERVER & POWERSERVER TELE

### 2.1 PowerServer Lite (15,000 Studies or less)

#### Required

Hardware Requirements	Recommended Hardware
Operating System	Windows Server 2016 Standard
CPU	Recent CPU (less than 5 years old) with at least 4 Cores
RAM	12 GB
Hard Drive(s)/Primary Storage	RAID 1, 2 x 2TB SATA drives.  One partition with at least 100GB for OS, Database and Image storage sized appropriately
Network Bandwidth (LAN)	1,000 Mbps
Software Requirements	Recommended Software
Antivirus	AVG Antivirus Business Edition AVG CloudCare
Microsoft Office Font Pack	Microsoft Word 2013 or later
Remote Access	LogMeIn will be supplied by RamSoft for the exclusive use of RamSoft Support.

#### Optional

Hardware	Recommended Hardware
UPS	1,500VA UPS
Software	Recommended Software
Hard Drive Imaging	Windows Backup, Veeam Backup & Replication (for Hyper-V)
Server Monitoring	LogMeIn Pro

## 2.2 PowerServer (Less than 30,000 studies)

### Required

Hardware Requirements	Recommended Hardware
Operating System	Windows Server 2016 Standard with Hyper-V
CPU	Recent CPU (less than 5 years old) with at least 4 Cores
RAM	16 GB
Hard Drive(s)/Primary Storage	RAID 6, 2TB SAS drives. One partition with at least 100GB for OS, Database and Image storage sized appropriately
Network Bandwidth (LAN)	1,000 Mbps
Software Requirements	Recommended Software
Antivirus	AVG Antivirus Business Edition AVG CloudCare
Microsoft Office Font Pack	Microsoft Word 2013 or later
Remote Access	LogMeIn will be supplied by RamSoft for the exclusive use of RamSoft Support.

### Optional

Hardware	Recommended Hardware
UPS	1,500VA UPS
Fax Board (if using ActFax)	Dialogic Brooktrout FaxBoard (PCIe)
Software	Recommended Software
Hard Drive Imaging	Windows Backup, Veeam Backup & Replication (for Hyper-V)
Server Monitoring	LogMeIn Pro



## 2.3 PowerServer (30,000 to 100,000 studies)

### Required

Hardware Requirements	Recommended Hardware
Operating System	Windows Server 2016 Standard with Hyper-V
CPU	Recent CPU (less than 5 years old) with at least 6 Cores
RAM	24 GB
Hard Drive(s)/Primary Storage	RAID 6, 4TB SAS drives.  One partition with at least 100GB for OS, Database and Image storage sized appropriately  Database is required to store on Solid-State Drive (SSD)
Network Bandwidth (LAN)	1,000 Mbps
Software Requirements	Recommended Software
Antivirus	AVG Antivirus Business Edition AVG CloudCare
Microsoft Office Font Pack	Microsoft Word 2013 or later
Remote Access	LogMeIn will be supplied by RamSoft for the exclusive use of RamSoft Support.

### Optional

Hardware	Recommended Hardware
UPS	1,500VA UPS
Fax Board (if using ActFax)	Dialogic Brooktrout FaxBoard (PCIe)
Software	Recommended Software
Hard Drive Imaging	Windows Backup, Veeam Backup & Replication (for Hyper-V)
Server Monitoring	LogMeIn Pro

## 2.4 PowerServer (100,000 to 200,000 studies)

### Required

Hardware Requirements	Recommended Hardware
Operating System	Windows Server 2016 Standard with Hyper-V
CPU	Recent CPU (less than 5 years old) with at least 8 Cores
RAM	32 GB
Hard Drive(s)/Primary Storage	RAID 6, 6TB SAS drives.  One partition with at least 100GB for OS, Database and Image storage sized appropriately  Database is required to store on Solid-State Drive (SSD)
Network Bandwidth (LAN)	1,000 Mbps
Software Requirements	Recommended Software
Antivirus	AVG Antivirus Business Edition AVG CloudCare
Microsoft Office Font Pack	Microsoft Word 2013 or later
Remote Access	LogMeIn will be supplied by RamSoft for the exclusive use of RamSoft Support.

### Optional

Hardware	Recommended Hardware
UPS	1,500VA UPS
Fax Board (if using ActFax)	Dialogic Brooktrout FaxBoard (PCIe)
Software	Recommended Software
Hard Drive Imaging	Windows Backup, Veeam Backup & Replication (for Hyper-V)
Server Monitoring	LogMeIn Pro

## 2.5 PowerServer (More than 200,000 studies)

It is recommended that all services should be deployed on a single server instead of a split server setup. This is due to a number of reasons. Firstly, it reduces the complexity of the installation and secondly it will simplify the upgrade process in the future. Thirdly, it prevents the local network issues from impacting the software i.e. communication problems between the database and web servers.

For setups with a very large number of end users, the web services component can be deployed in a **Web Farm** which will enable the software to take advantage of the available RAM.

### Required

Hardware Requirements	Recommended Hardware
Operating System	Windows Server 2016 Standard or Datacenter with Hyper-V
CPU	Recent CPU (less than 5 years old) with at least 16 Cores
RAM	64/128 GB
Hard Drive(s)/ Primary Storage	RAID 6, at least 6TB SAS storage, Fiber Channel or iSCSI External Storage (One partition with at least 100GB for OS, Database, DB backup and Image storage sized appropriately)  Database is required to store on Solid-State Drive (SSD)
Network Bandwidth (LAN)	1000 Mbps Network (10Gbps may be needed if many users directly access the server without a PowerCache).
Software Requirements	Recommended Software
Antivirus	AVG Antivirus Business Edition AVG CloudCare
Microsoft Office Font Pack	Microsoft Word 2013 or later
Remote Access	LogMeIn will be supplied by RamSoft for the exclusive use of RamSoft Support, Symantec PC Anywhere
Backup	SAN Replication for Image Replication

### Optional

Hardware	Recommended Hardware
UPS	1,500VA UPS
Fax Board (if using ActFax)	Dialogic Brooktrout FaxBoard (PCIe)
Software	Recommended Software
Hard Drive Imaging	Windows Backup, Veeam Backup & Replication (for Hyper-V)
Server Monitoring	LogMeIn Pro, Sinatica

### 3 POWERSERVER RIS/PACS

#### 3.1 PowerServer RIS/PACS (15,000 Studies or less)

##### Required

Hardware Requirements	Recommended Hardware
Operating System	Windows Server 2016 Standard with Hyper-V
CPU	Recent CPU (less than 5 years old) with at least 4 Cores
RAM	16 GB
Hard Drive(s)/Primary Storage	RAID 1, 2 x 1TB SATA drives.  One partition with at least 100GB for OS, Database and Image storage sized appropriately
Network Bandwidth (LAN)	1,000 Mbps
Software Requirements	Recommended Software
Antivirus	AVG Antivirus Business Edition AVG CloudCare
Microsoft Office Font Pack	Microsoft Word 2013 or later
Remote Access	LogMeIn will be supplied by RamSoft for the exclusive use of RamSoft Support.

##### Optional

Hardware	Recommended Hardware
UPS	1,500VA UPS
Fax Board (if using ActFax)	Dialogic Brooktrout FaxBoard (PCIe)
Software	Recommended Software
Hard Drive Imaging	Windows Backup, Veeam Backup & Replication (for Hyper-V)
Server Monitoring	LogMeIn Pro

### 3.2 PowerServer RIS/PACS (Less than 30,000 studies)

#### Required

Hardware Requirements	Recommended Hardware
Operating System	Windows Server 2016 Standard with Hyper-V
CPU	Recent CPU (less than 5 years old) with at least 6 Cores
RAM	16 GB
Hard Drive(s)/Primary Storage	RAID 6, 2TB SAS drives. One partition with at least 100GB for OS, Database and Image storage sized appropriately
Network Bandwidth (LAN)	1,000 Mbps
Software Requirements	Recommended Software
Antivirus	AVG Antivirus Business Edition AVG CloudCare
Microsoft Office Font Pack	Microsoft Word 2013 or later
Remote Access	LogMeIn will be supplied by RamSoft for the exclusive use of RamSoft Support.

#### Optional

Hardware	Recommended Hardware
UPS	1,500VA UPS
Fax Board (if using ActFax)	Dialogic Brooktrout FaxBoard (PCIe)
Software	Recommended Software
Hard Drive Imaging	Windows Backup, Veeam Backup & Replication (for Hyper-V)
Server Monitoring	LogMeIn Pro

### 3.3 PowerServer RIS/PACS (30,000 to 100,000 studies)

#### Required

Hardware Requirements	Recommended Hardware
Operating System	Windows Server 2016 Standard with Hyper-V
CPU	Recent CPU (less than 5 years old) with at least 8 Cores
RAM	32 GB RAM
Hard Drive(s)/Primary Storage	RAID 6, 4TB SAS drives.  One partition with at least 100GB for OS, Database and Image storage sized appropriately  Database is required to store on Solid-State Drive (SSD)
Network Bandwidth (LAN)	1,000 Mbps
Software Requirements	Recommended Software
Antivirus	AVG Antivirus Business Edition AVG CloudCare
Microsoft Office Font Pack	Microsoft Word 2013 or later
Remote Access	LogMeIn will be supplied by RamSoft for the exclusive use of RamSoft Support.

#### Optional

Hardware	Recommended Hardware
UPS	1,500VA UPS
Fax Board (if using ActFax)	Dialogic Brooktrout FaxBoard (PCIe)
Software	Recommended Software
Hard Drive Imaging	Windows Backup, Veeam Backup & Replication (for Hyper-V)
Server Monitoring	LogMeIn Pro

### 3.4 PowerServer RIS/PACS (100,000 to 200,000 studies)

#### Required

Hardware Requirements	Recommended Hardware
Operating System	Windows Server 2016 Standard with Hyper-V
CPU	Recent CPU (less than 5 years old) with at least 8 Cores
RAM	32 GB RAM
Hard Drive(s)/Primary Storage	RAID 6, 6TB SAS drives  One partition with at least 100GB for OS, Database and Image storage sized appropriately  Database is required to store on Solid-State Drive (SSD)
Network Bandwidth (LAN)	1,000 Mbps
Software Requirements	Recommended Software
Antivirus	AVG Antivirus Business Edition AVG CloudCare
Microsoft Office Font Pack	Microsoft Word 2013 or later
Remote Access	LogMeIn will be supplied by RamSoft for the exclusive use of RamSoft Support.

#### Optional

Hardware	Recommended Hardware
UPS	1,500VA UPS
Fax Board (if using ActFax)	Dialogic Brooktrout FaxBoard (PCIe)
Software	Recommended Software
Hard Drive Imaging	Windows Backup, Veeam Backup & Replication (for Hyper-V)
Server Monitoring	LogMeIn Pro

### 3.5 PowerServer RIS/PACS (More than 200,000 studies)

It is recommended that all services should be deployed on a single server instead of a split server setup. This is due to a number of reasons. Firstly, it reduces the complexity of the installation and secondly it will simplify the upgrade process in the future. Thirdly, it prevents the local network issues from impacting the software i.e. communication problems between the database and web servers.

For setups with a very large number of end users, the web services component can be deployed in a **Webserver Farm** which will enable the software to take advantage of the available RAM.

#### Required

Hardware Requirements	Recommended Hardware
Operating System	Windows Server 2016 Standard or DataCenter with Hyper-V
CPU	Recent CPU (less than 5 years old) with at least 16 Cores
RAM	64/128 GB
Hard Drive(s)/ Primary Storage	RAID 6, at least 6TB SAS storage, Fiber Channel or iSCSI External Storage (One partition with at least 100GB for OS, Database, DB backup and Image storage sized appropriately)  Database is required to store on Solid-State Drive (SSD)
Network Bandwidth	1,000 Mbps Network (10Gbps may be needed if many users directly access the server without a PowerCache)
Software Requirements	Recommended Software
Antivirus	AVG Antivirus Business Edition AVG CloudCare
Microsoft Office Font Pack	Microsoft Word 2013 or later
Remote Access	LogMeIn will be supplied by RamSoft for the exclusive use of RamSoft Support.
Hard Drive Imaging	Windows Backup, Veeam Backup & Replication (for Hyper-V)
Server Monitoring	LogMeIn Pro, Sinatica

#### Optional

Hardware	Recommended Hardware
UPS	1,500VA UPS
Fax Board (if using ActFax)	Dialogic Brooktrout FaxBoard (PCIe)



## 4 ROUTERS AND GATEWAY

### 4.1 Router (Less than 30,000 Studies per year)

#### Required

Hardware Requirements	Recommended Hardware
Operating System	Microsoft Windows 10 Pro (64-Bit)
CPU	Recent CPU (less than 5 years old) with at least 4 Cores
RAM	8 GB
Hard Drive(s)/Primary Storage	RAID1, 2 x 500 GB Hybrid HDD, Database and Image storage sized appropriately
Network Bandwidth (LAN)	1,000 Mbps
Software Requirements	Recommended Software
Antivirus	Windows Defender AVG Antivirus Business Edition AVG CloudCare
Remote Access	LogMeIn will be supplied by RamSoft for the exclusive use of RamSoft Support.

#### Optional

Software	Recommended Software
Hard Drive Imaging	Windows Backup
Server Monitoring	LogMeIn Pro

## 4.2 Router (More than 30,000 Studies per year)

### Required

Hardware Requirements	Recommended Hardware
Operating System	Windows Server 2016 Standard with Hyper-V
CPU	Recent CPU (less than 5 years old) with at least 4 Cores
RAM	8 GB
Hard Drive(s)/Primary Storage	RAID1, 2 x 500 GB Hybrid HDD, Database and Image storage sized appropriately
Network Bandwidth (LAN)	1,000 Mbps
Software Requirements	Recommended Software
Antivirus	AVG Antivirus Business Edition AVG CloudCare
Remote Access	LogMeIn will be supplied by RamSoft for the exclusive use of RamSoft Support.

### Optional

Software	Recommended Software
Hard Drive Imaging	Windows Backup, Veeam Backup & Replication (for Hyper-V)
Server Monitoring	LogMeIn Pro

## 4.3 Gateway QC

### Required

Hardware Requirements	Recommended Hardware
Operating System	Microsoft Windows 10 Pro (64-Bit)
CPU	Recent CPU (less than 5 years old) with at least 4 Cores
RAM	8 GB
Hard Drive(s)/Primary Storage	256 GB SSD, Database and Image storage sized appropriately
Network Bandwidth (LAN)	1,000 Mbps
Software Requirements	Recommended Software
Antivirus	Windows Defender AVG Antivirus Business Edition AVG CloudCare
Remote Access	LogMeIn will be supplied by RamSoft for the exclusive use of RamSoft Support.
Word Processing	Microsoft Word 2013 (32-bit) or later

### Optional

Hardware	Recommended Hardware
UPS	1,500VA UPS
Dictation Microphones	Philips SpeechMike
Scanners	Any WIA Scanner
Film Digitizer	Any Vidar Film Digitizer
Rapid Keys	RamSoft RapidKeys
CD/DVD Label Printer	Primera Bravo SE Disc Publisher
Software	Recommended Software
Hard Drive Imaging	Windows Backup
Transcription	Dragon Medical Practice Edition 2.2

## 4.4 Gateway Mammo

### Required

Hardware Requirements	Recommended Hardware
Operating System	Windows 10 Pro (64-bit). Workstation Grade Platform.
CPU	Recent CPU (less than 5 years old) with at least 4 Cores
RAM	16 GB
Hard Drive/Primary Storage	256 GB SSD, Database and Image storage sized appropriately
Monitors	Eizo RX850 8MP Color Diagnostic Display
Network Bandwidth (LAN)	1,000 Mbps
Graphic Video Card	ATI FirePro W5100
Software Requirements	Recommended Software
Antivirus	Windows Defender AVG Antivirus Business Edition AVG CloudCare
Remote Access	LogMeIn will be supplied by RamSoft for the exclusive use of RamSoft Support.
Word Processing	Microsoft Word 2013 (64-bit) or later

### Optional

Hardware	Recommended Hardware
UPS	1,500VA UPS
Dictation Microphones	Philips SpeechMike
Rapid Keys	RamSoft RapidKeys
Software	Recommended Software
Hard Drive Imaging	Windows Backup
Transcription	Dragon Medical Practice Edition 2.2

## 5 POWERCACHE WORKSTATIONS

### 5.1 Router with PowerCache/ only PowerCache (Less than 30,000 Studies per year)

#### Required

Hardware Requirements	Recommended Hardware
Operating System	Windows 10 Pro (64-Bit)
CPU	Recent CPU (less than 5 years old) with at least 4 Cores
RAM	8 GB
Hard Drive(s)/Primary Storage	1 Partition 64 GB (Router) RAID1, 2 x 1TB drives. (PowerCache image storage sized appropriately)
Network Bandwidth (LAN)	1,000 Mbps
Software Requirements	Recommended Software
Antivirus	Windows Defender AVG Antivirus Business Edition AVG CloudCare
Remote Access	LogMeIn will be supplied by RamSoft for the exclusive use of RamSoft Support.

#### Optional

Software	Recommended Software
Hard Drive Imaging	Windows Backup

## 5.2 Router with PowerCache or only PowerCache (More than 30,000 Studies per year)

### Required

Hardware Requirements	Recommended Hardware
Operating System	Windows Server 2016 Standard
CPU	Recent CPU (less than 5 years old) with at least 4 Cores
RAM	12 GB RAM
Hard Drive(s)/Primary Storage	1 Partition 70 GB RAID 1 (Router) RAID 6, 2 TB drives. (PowerCache image storage sized appropriately)
Network Bandwidth (LAN)	1,000 Mbps
Software Requirements	Recommended Software
Antivirus	AVG Antivirus Business Edition AVG CloudCare
Remote Access	LogMeIn will be supplied by RamSoft for the exclusive use of RamSoft Support.

### Optional

Software	Recommended Software
Hard Drive Imaging	Windows Backup

## 6 SCHEDULER, TECH, TRANSCRIPTIONIST, AND PHYSICIAN REVIEW WORKSTATIONS

### Required

Hardware Requirements	Recommended Hardware
Operating System	Microsoft Windows 10 Pro (64-Bit)
CPU	Recent CPU (less than 5 years old) with at least 4 Cores
RAM	16 GB
Hard Drive(s)/Primary Storage	1 Partition with at least 50GB of free space
Network Bandwidth (LAN)	1,000 Mbps
Software Requirements	Recommended Software
Antivirus	Windows Defender AVG Antivirus Business Edition AVG CloudCare
Remote Access	LogMeIn will be supplied by RamSoft for the exclusive use of RamSoft Support.
Word Processing	Microsoft Word 2013 (64-bit) or later
Web Browser	Microsoft Internet Explorer 11+

### Optional

Hardware	Recommended Hardware
Dictation Microphones	Philips SpeechMike
Transcription Foot Pedals	Philips LFH-2310
Software	Recommended Software
Hard Drive Imaging	Windows Backup

## 7 RADIOLOGIST WORKSTATIONS

### 7.1 Supported Platforms for Speech Recognition Software

Speech Recognition	Operating System			Internet Explorer	Microsoft Word (32-bit or 64-bit)		
	7	8.1	10	11	2010	2013	2016
Speech Understanding™	X	X	X	X	X	X	X
Dragon Medical Practice Edition 1.0	X				X		
Dragon Medical Practice Edition 2.3	X	X	X	X	X	X	X
Dragon Medical Practice Edition 4	X	X	X	X	X	X	X

### 7.2 Radiologist Workstation

#### Required

Hardware Requirements	Supported Hardware
Operating System	Microsoft Windows 10 Pro (64-bit) with the latest Windows updates is recommended. Windows 7 (64-bit) is supported but not the most optimum recommendation.
CPU	Recent CPU (less than 5 years old) with at least 4 Cores
RAM	16 GB
Hard Drive(s)/ Primary Storage	128 GB SSD
Network Bandwidth (LAN)	1,000 Mbps
Monitors	WIDE, Eizo, Totoku
Graphic Video Card	AMD FirePro W4300/W5100 or equivalent with 4GB
Software Requirements	Supported Software
Antivirus	Windows Defender AVG Antivirus Business Edition AVG CloudCare
Remote Access	LogMeIn will be supplied by RamSoft for the exclusive use of RamSoft Support.
Word Processing	Microsoft Word 2010, 2013 or 2016 (32/64-bit)
Web Browser	Microsoft Internet Explorer 11+

#### Optional

Hardware	Recommended Hardware
UPS	1,500VA UPS
Dictation Microphones	Philips SpeechMike
Software	Recommended Software
Hard Drive Imaging	Windows Backup
Transcription	Dragon Medical Practice Edition 4



## 8 RAMSOFT BACK-UP PLANS

### A completely Web – Based Image Management Solution

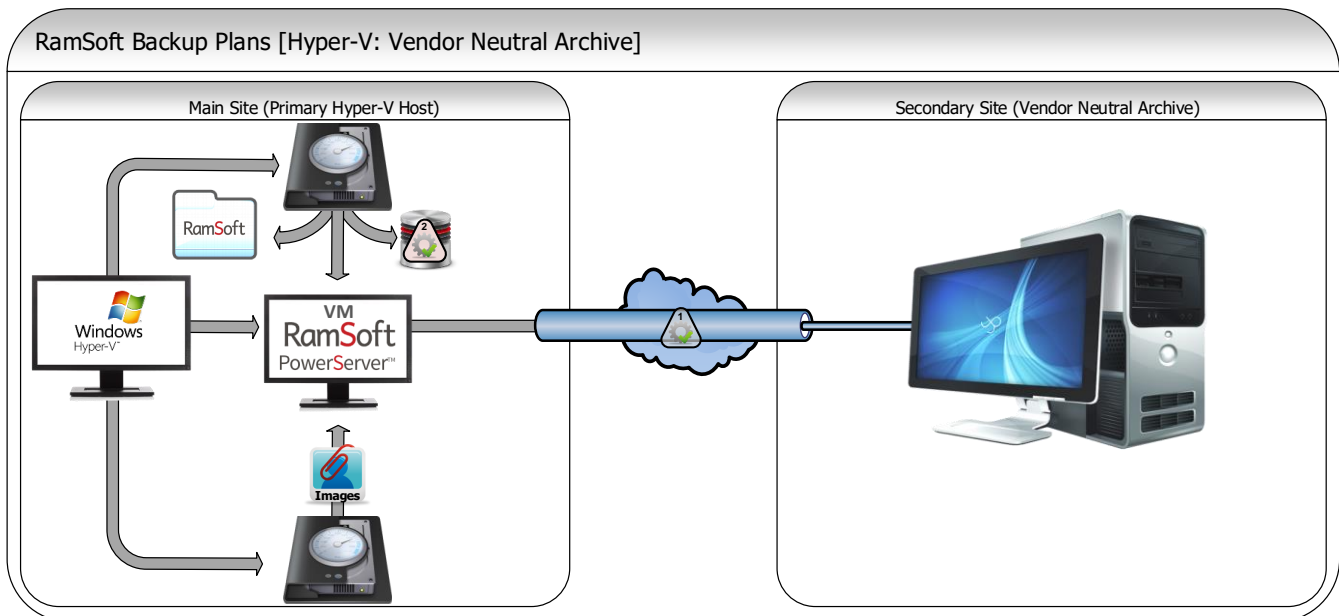
Data Redundancy and Fault Tolerance are extremely important considerations when it comes to your organization’s patient data. Ramsoft, Inc. has developed a seven –tiered backup offering for virtualized server environments. In this section, you will find our VNA, Basic, Bronze, Silver, Gold, Platinum and Diamond-level Backup Plans for virtualized environments.

### 8.1 Vendor Neutral Archive (VNA) PLAN



#### Replication of DICOM Images to a Vendor Neutral DICOM Device

The VNA Plan utilizes a DICOM trigger on the Primary PowerServer VM to automatically route studies to the Vendor Neutral Archive, based on study status transitions. This provides us with a second copy of all image data at a Secondary Site, which can be used for disaster recovery purposes – this does not ensure High Availability. The DICOM image data can be pulled back to the primary server once the failure has been resolved.





Legend													
Equalogic Snapshot Operation	Hyper-V Snapshot Operation	Virtual Hard Disk	RamSoft DICOM Replication	RamSoft Incremental Database Backups	PowerServer Synchronization Script Operation	Hyper-V Replication Operation	RamSoft Databases (PACS, Report, Mirth)	RamSoft Critical Directories and Files	RamSoft PowerServer VM	Network Attached Storage (NAS)	Storage Area Network (SAN)	LAN Connection	WAN Connection

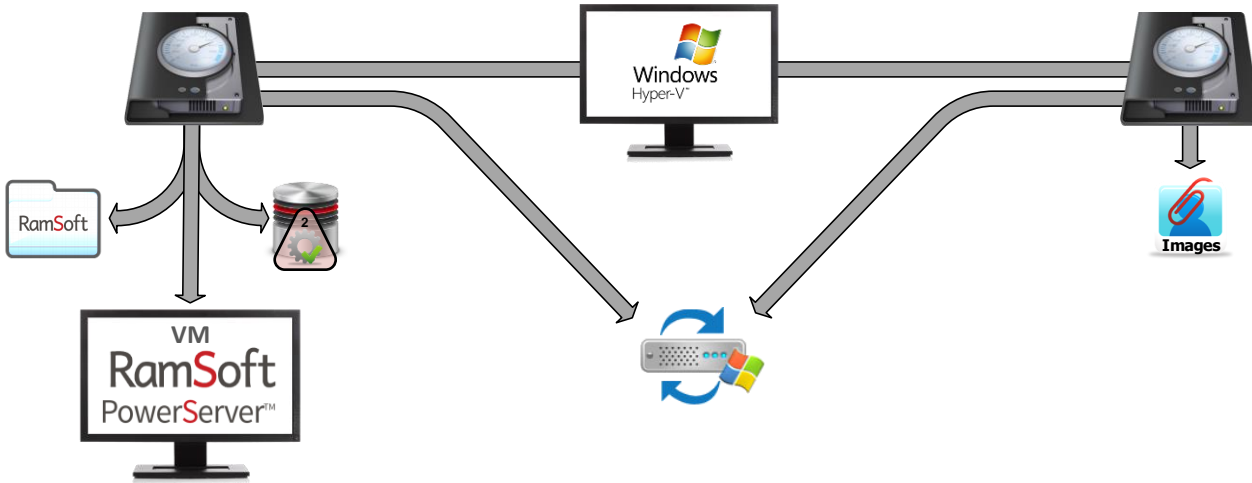
## 8.2 Basic Plan

### Incremental Database Backups onto Local Storage, and Hyper-V Snapshots before RamSoft Software Upgrades

The Basic Backup Plan utilizes RamSoft Incremental Database Backups and Hyper-V Snapshots that are manually created before each RamSoft Software upgrade. The snapshots are stored on local storage, since external storage is not used in this scenario. VM Snapshots are deleted after the system has passed post-upgrade validation. This is reserved for low-volume, non-mission-critical customers.

RamSoft Backup Plans [Hyper-V: Basic]

Main Site (Primary Hyper-V Host)



Legend

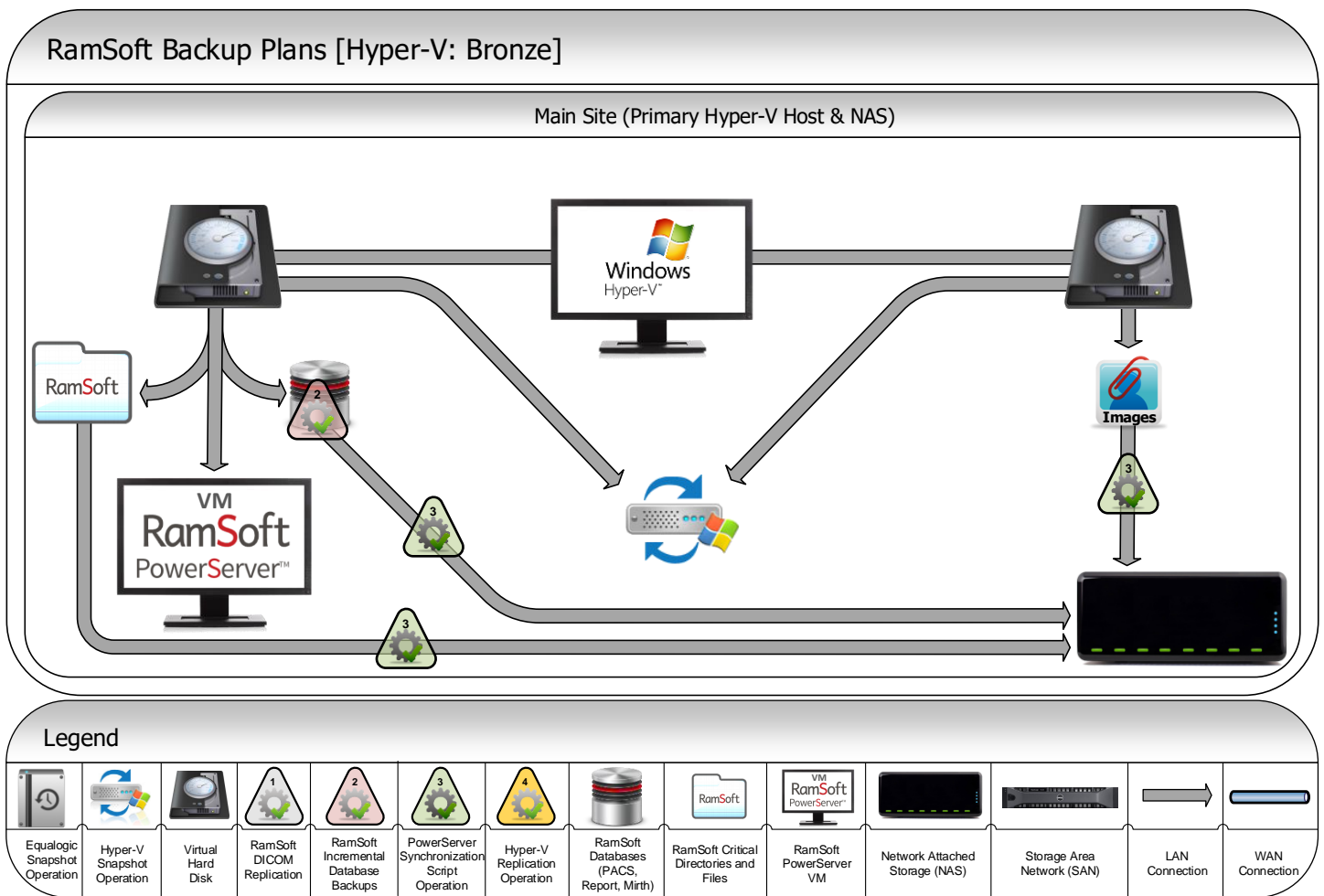
Equalogic Snapshot Operation	Hyper-V Snapshot Operation	Virtual Hard Disk	RamSoft DICOM Replication	RamSoft Incremental Database Backups	PowerServer Synchronization Script Operation	Hyper-V Replication Operation	RamSoft Databases (PACS, Report, Mirth)	RamSoft Critical Directories and Files	RamSoft PowerServer VM	Network Attached Storage (NAS)	Storage Area Network (SAN)	LAN Connection	WAN Connection

### 8.3 Bronze Plan

#### Backup of image volume(s), database backups, and critical directories onto local Network Attached Storage (NAS)



The Bronze Backup Plan for Hyper-V deployments is a Hyper-V Host with the RamSoft PowerServer Synchronization Script configured to store PowerServer database backups and critical directories on an external NAS. In this scenario, backup jobs are scheduled to run on a nightly basis (or as often as required), and are configured to copy the data from the PowerServer VM to a Network Attached Storage device. This is reserved for low-volume, non-mission-critical customers.



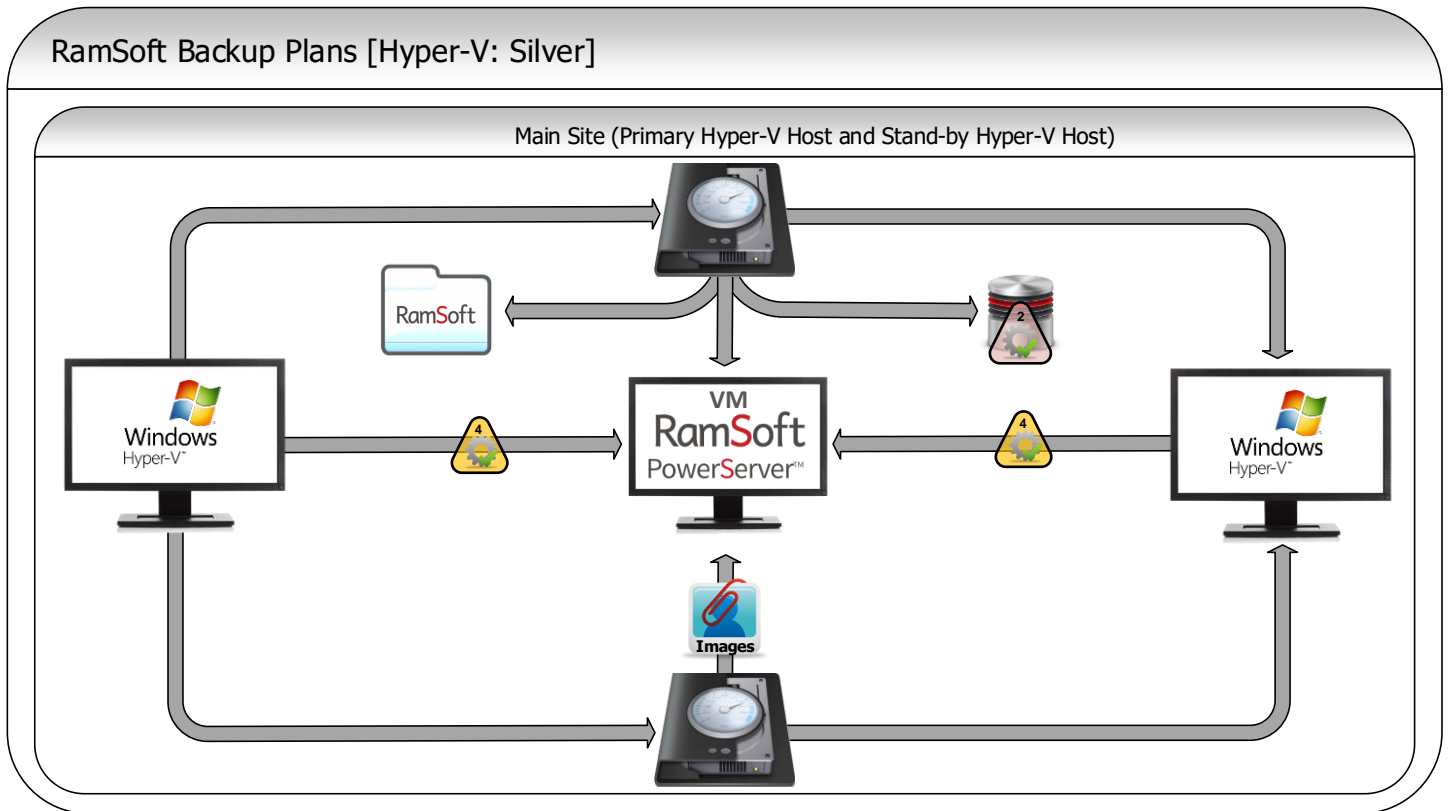
## 8.4 Silver Plan

### Hyper-V Replication to a Stand-by VM on a Secondary Hyper-V Host at the Same Site



The Silver Backup Plan for Hyper-V deployments is two Hyper-V Hosts at the same site, with Hyper-V Replica configured to replicate the VM on the primary Hyper-V Host to a stand-by VM on the primary Hyper-V Host to a stand-by VM on the secondary Hyper-V Host. Both Hyper-V Hosts should be connected via crossover cable. This solution protects against hardware failures on the hosts, but not a total loss of the site.

#### RamSoft Backup Plans [Hyper-V: Silver]



#### Legend

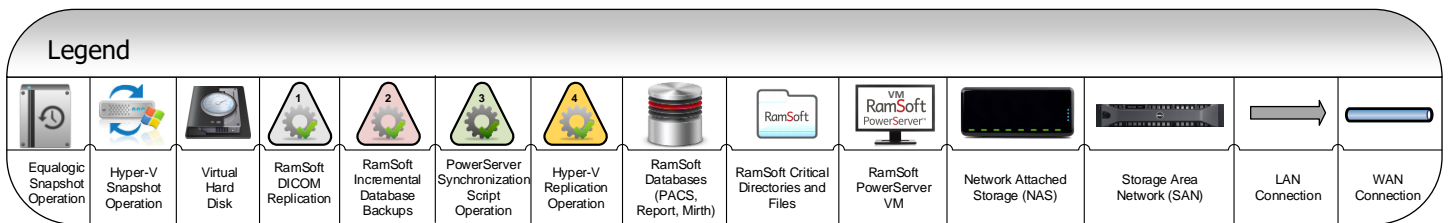
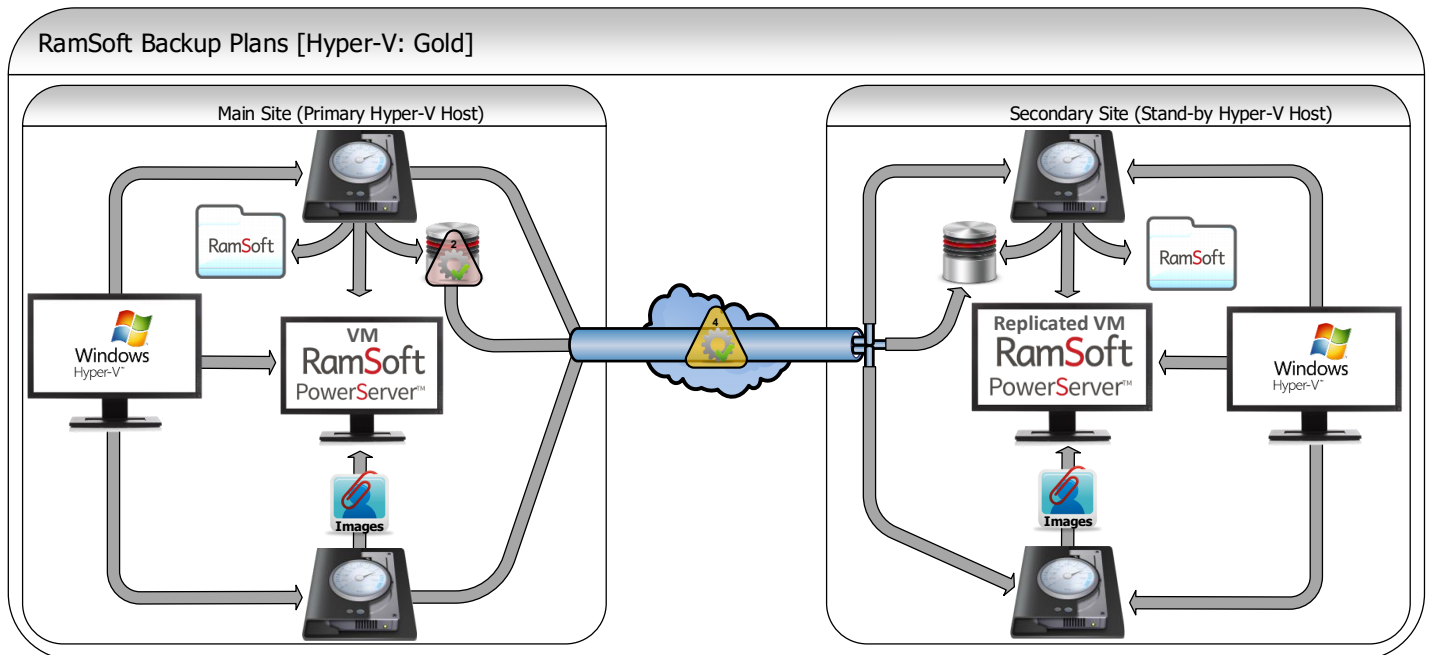
Equalogic Snapshot Operation	Hyper-V Snapshot Operation	Virtual Hard Disk	RamSoft DICOM Replication	RamSoft Incremental Database Backups	PowerServer Synchronization Script Operation	Hyper-V Replication Operation	RamSoft Databases (PACS, Report, Mirth)	RamSoft Critical Directories and Files	VM RamSoft PowerServer™	Network Attached Storage (NAS)	Storage Area Network (SAN)	LAN Connection	WAN Connection

## 8.5 Gold Plan

### Hyper-V Replication to a Stand-by VM on a Secondary Hyper-V Host at a Secondary Site



The Gold BACKUP Plan for Hyper-V deployments is two Hyper-V Hosts, at two separate sites, with Hyper-V Replica configured to replicate the VM on the Primary Hyper-V Host to a stand-by VM on the Secondary Hyper-V Host at a Secondary Site. In this scenario, Hyper-V is configured to replicate all changes in the Primary VM to a replicated copy of the VM on the Secondary Host at the Secondary Site. Hyper-V Hosts must have adequate bandwidth to allow for successful replication of changes. This protects against hardware failures on the hosts, and loss of any one site.

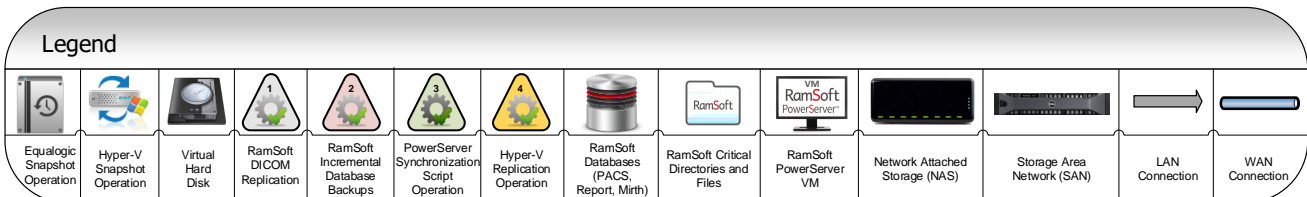
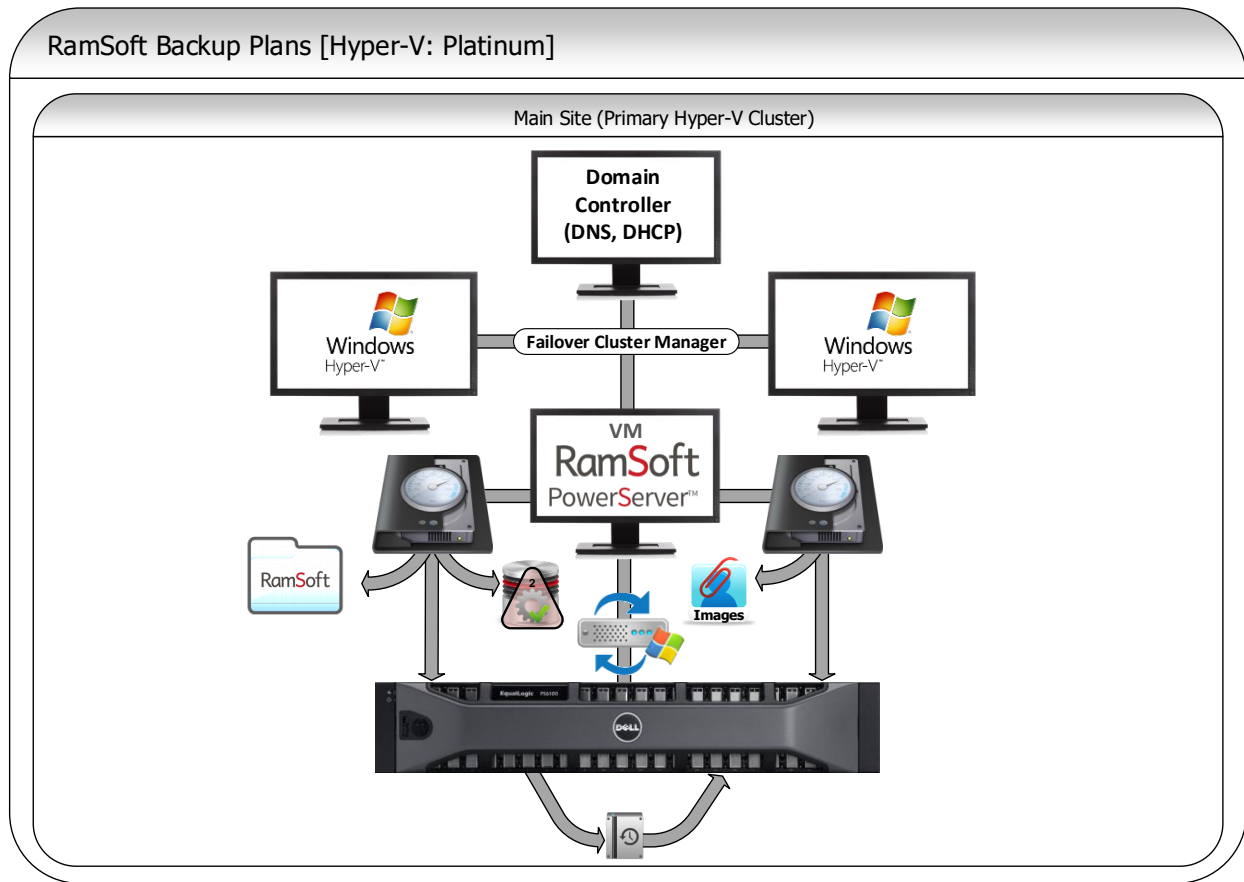


## 8.6 Platinum Plan

### Single-Site, High Performance Hyper-V Cluster



The Platinum Backup plan has been developed to provide a high-performance, redundant solution for RamSoft’s customers. The Platinum Backup plan for Hyper-V deployment utilizes a clustered set of Hyper-V servers to host the PowerServer VM, and stores applications, images, databases, and database backups on a high-performance SAN. In this scenario, the PowerServer VM can be seamlessly moved between hosts for maintenance, updates, or failover purposes. This protects against hardware failures on the hosts, and provides a high performance solution, but does not protect against total loss at the site.

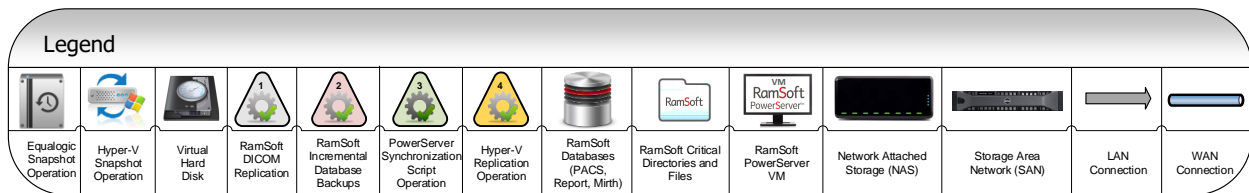
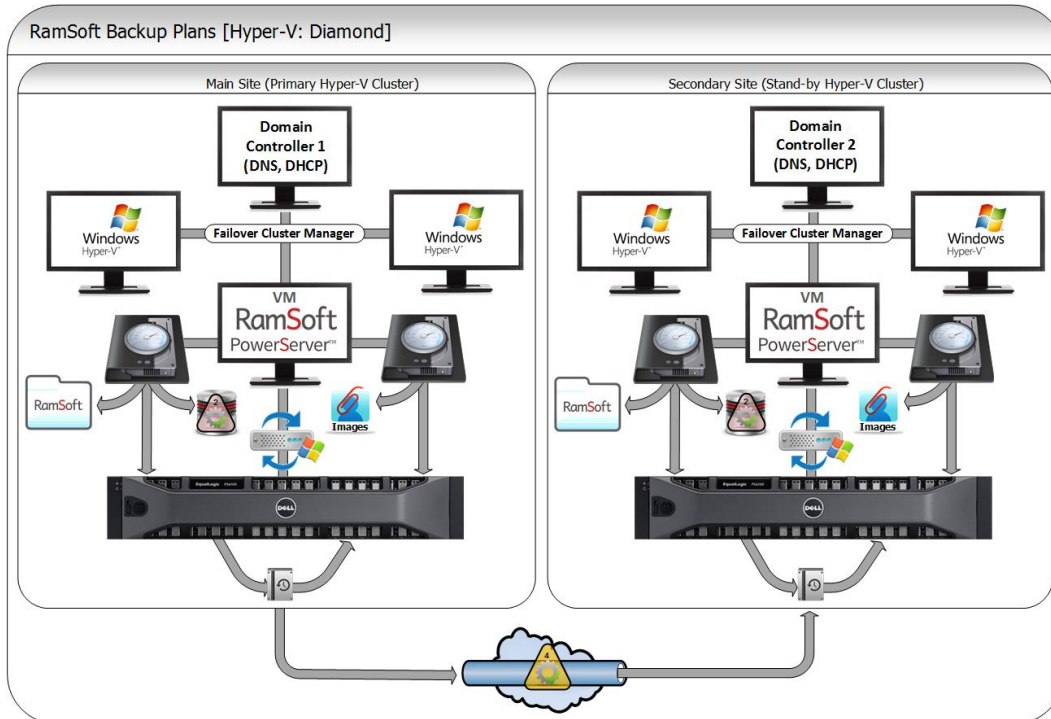


## 8.7 Diamond Plan

### Backup of image volume(s), incremental database backups, and critical directories to Redundant SAN/Cluster



The Diamond Backup Plan has been developed to provide the highest performance, highest redundancy solution for RamSoft’s largest customers. The Diamond Backup Plan for Hyper-V deployments utilizes two clustered, geo-redundant, diskless sets of Hyper-V servers to host the PowerServer VM, and stores applications, images, databases, and databases backups on a high performance SAN. In this scenario, Hyper-V is configured to replicate all changes in the primary VM to a replicated copy of the VM on the secondary Cluster at the Secondary Site. The PowerServer VM can be seamlessly moved between hosts for maintenance, update, or failover purposes. This protects against hardware failures on the hosts, provides a high performance solution, and protects against loss of any one site.





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## 8.8 Important Notes

- The Gold, Platinum, and Diamond Backup Plans require that all remote sites have DICOM and HL7 connectivity to both the primary and stand-by servers. Lack of DICOM or HL7 connectivity to the stand-by server will result in disaster recovery abilities, without maintaining seamless business continuity. Also, VMWare (or other HyperVisors) may be used instead of Hyper-V, but RamSoft cannot assist with deployment or configuration.
- Note that for any Backup plan, the redundant hardware storage must be equal to primary hardware storage.

## VERSIONS

Version	Revision Notes	Updated by	Reviewed by	Effective Date
Rev A	Updated for 6.0 Release	LLG	VRN	2014/12/12
Rev B	Updated for 6.0 GA Release	NWC	LLG	2015/07/24
Rev C	Removed the requirements for Adobe PDF Reader	LLG	SRN	2015/08/21
Rev D	Added support for Word 2016 (Not recommended for using with Dragon and M*Modal yet) and the requirement to install Microsoft Word in PowerServer.	LLG	SRN	2015/10/28
Rev E	Remove support for Windows 8 and Internet Explorer 10.	LLG	SRN	2016/02/10
Rev F	Added a section on RamSoft Backup plans	RDV	NC	2016/08/03
Rev G	Modified the Backup Plans Images and Legend	MAB	RDV	2016/05/31
Rev H	Modified the Radiologist Workstation Hardware requirements and included Dragon 2.3 Support for Word 2016	RDV	LLG	2016/08/19
Rev I	Added support for Windows Server 2016 and JRE 8	RDV	LLG	2016/11/09
Rev J	Added the recommendation to store Database on SSD storage device	LLG	SRN	2017/01/16
Rev K	Removed minimum supported hardware column in Section 4.1 Changed Windows 8.1 to Windows 10 Pro Changed Windows 2012 R2 to Windows 2016 The recommended for MS Word is set to Word 2013 or later	JZG	LLG	2017/09/20
Rev L	Removed minimum supported hardware column in all sections and revised the CPU requirements	LLG	VRN	2017/12/12
Rev M	Added support for Dragon Medical Practice Edition 4	JZG	LLG	2018/05/10
Rev N	Modified the Radiologist Workstation Hardware requirements to support Windows 10	JZG	LLG	2018/09/20