Knowledge Exchange (KE) V2.0 System IT Specifications

Knowledge Exchange (KE) V2.0 System IT Specifications

SYSTEM REQUIREMENTS

A dedicated server (large, small, or mini) or standalone workstation must be prepared by the facility for the KE System. A standalone workstation must also have a DVD drive that can read DVD-R DL to install the KE software.

NOTE: To determine your server needs, refer to the *Maximum Connectable Devices* section in this document. Server requirements (see 'large', 'small', or 'mini' server below) must be met, whether the server is physical or a virtual server. The KE System application installation will create a folder on the OS drive. For machine capacity, refer to Table 1: Required HDD and External Storage Device.

Virtual Machine

KE server can be installed in the following virtual environments:

- VMware vSphere® Hypervisor

Virtual Machine Hardware Requirements

Identical to large or small server memory, and processor. Hard drive capacities must have the ability to grow to the stated requirements.

Virtual Machine Space Requirements

For an initial build, the KE installer requires the following minimum free space for each partition for successful installation.

- **Windows® System (Usually [C:]):** 1.1 GB besides Windows OS
- **System (Application):** 21 GB
- **Database (Data):** 10 GB
- **System (Data):** See Table 1

- **OS:** Windows Server® 2012 R2 Standard Edition 64-bit
- **Ethernet (Wired Network Adapter):**

  For details, refer to 'Operating System Settings' in the *Connectivity Cabling, Ports, and Data Transfer* **section of this document.**

(Virtual Machine) sizing requirements are based on the compression setting on the CV: See Table 1

Large Server Hardware

- **Processor:** Intel Xeon E5-2609 2.40 GHz or greater
- **Memory:** 32 GB or greater
- **Hard Drive:** See Table 1

- **Display Resolution:** WXGA (1366 x 768) or greater
- **OS:** Windows Server 2012 R2 Standard Edition 64-bit
- **Ethernet:** 100 BASE-TX or greater

  For details, refer to 'Operating System Settings' in the *Connectivity Cabling, Ports, and Data Transfer* section of this document.

SYSTEM REQUIREMENTS (CONT.)

Small Server Hardware

- **Processor:** Intel Xeon E5-2407 2.20 GHz or greater
- **Memory:** 16 GB or greater
- **Hard Drive:** See Table 1

- **Display Resolution:** WXGA (1366 x 768) or greater
- **OS:** Windows Server 2012 R2 Standard Edition 64-bit
- **Ethernet:** 100 BASE-TX or greater

  For details, refer to 'Operating System Settings' in the *Connectivity Cabling, Ports, and Data Transfer* section of this document.

Mini Server Hardware

- **Processor:** Intel Core i5-2540 2.60 GHz or greater
- **Memory:** 4 GB or greater
- **Hard Drive:** See Table 1

- **Display Resolution:** WXGA (1366 x 768) or greater
- **OS:** Windows Server 2012 R2 Standard Edition 64-bit
- **Ethernet:** 100 BASE-TX or greater

  For details, refer to 'Operating System Settings' in the *Connectivity Cabling, Ports, and Data Transfer* section of this document.

Standalone Workstation Hardware

- **Processor:** Intel Core i5-2540 2.60 GHz or greater
- **Memory:** 4 GB or greater
- **Hard Drive:** See Table 1
- **Display Resolution:** WXGA (1366 x 768) or greater

- **OS:** Windows 7 Professional SP1 64-bit Windows 8.1 Pro 64-bit (Windows 10 not supported)
- **Ethernet (Wired Network Adapter):**

  For details, refer to 'Operating System Settings' in the *Connectivity Cabling, Ports, and Data Transfer* section of this document.

NOTE: Hardware that has been used for IN10A R1.0 can be reused for the KE System. However, the Lenovo T520 laptop does not support Windows OS 8.1.

Client Hardware

- **Processor:** Meets system requirements for Windows 7, and/or Windows 8.1, or Windows 10 or greater, to install
- **Memory:** Same as above
- **Hard Drive:** Same as above
- **Display Resolution:** WXGA (1366 x 768) or greater

- **OS:** Windows 7 Professional SP1 32-bit / 64-bit* Windows 8.1 Pro 32-bit / 64-bit, Windows 10 version 1607 Pro32-bit / 64-bit
  (* A change of the theme to Windows Classic is not supported)
- **Ethernet (Wired or Wireless Network Adapter):**

  For details, refer to 'Operating System Settings' in the *Connectivity Cabling, Ports, and Data Transfer* section of this document.

NOTE: Client hardware does not need to be a dedicated system.

Table 1: Required HDD and External Storage Device

NOTE: Data is based on five (5) years of use, and HL7 and/or DICOM values are based on a maximum of 100 images per exam.

The number of exams performed per day	RMM only	
	HDD free space (not including OS)	**Backup Location free space**
1-50	45GB or greater	80 GB or greater
51-100	55 GB or greater	155 GB or greater
101-150	60 GB or greater	230 GB or greater
151-200	70 GB or greater	305 GB or greater
201-250	80 GB or greater	380 GB or greater

The number of exams performed per day	KE HL7 and/or KE DICOM					
	HDD free space (not including OS)			**Backup Location free space**		
	TIFF	**1/5 JPEG**	**1/10 JPEG**	**TIFF**	**1/5 JPEG**	**1/10 JPEG**
1-50	345 GB or greater	150 GB or greater	125 GB or greater	320 GB or greater	125 GB or greater	100 GB or greater
51-100	615 GB or greater	220 GB or greater	170 GB or greater	640 GB or greater	250 GB or greater	200 GB or greater
101-150	880 GB or greater	290 GB or greater	215 GB or greater	960 GB or greater	370 GB or greater	295 GB or greater
151-200	1.2TB or greater	360 GB or greater	260 GB or greater	1.3 TB or greater	495 GB or greater	395 GB or greater
201-250	1.4 TB or greater	430 GB or greater	310 GB or greater	1.6 TB or greater	615 GB or greater	495 GB or greater

GENERAL REQUIREMENTS

Naming Conventions – PC name

- Do not rename the server after Knowledge Exchange (KE) is installed. The KE system does not function properly if renamed.

- You can change the PC name of the KE client.

- Use only single-byte alphanumeric characters for the computer name and Windows OS account name of the server.

- Make sure the computer name of the KE server, and any account name managed by Active Directory (AD) are not the same. If both, computer name and user account, are the same in AD, the KE System will not function properly.

Cloud Installation is Not Supported

- Server software installation requires administrative privileges and the use of a local administrative account.

Active Directory (AD)

- KE does not support the use of Active Directory (AD) to manage KE user accounts. AD is only supported for management of Windows OS accounts.

SECURITY

Certificate Requirements

The Knowledge Exchange (KE) installer configures the application to use self-signed certificates. These are generated from IIS, as SHA-1 SSL 2048-bit certificates by default. Customer-provided certificates can be used and are considered a post-install activity. Customer-provided certificates are optional, and are to be configured as SHA-256 RSA 2048-bit certificates. There must be a Domain Name System (DNS) server in the environment to support Fully Qualified Domain Name (FQDN).

You can install security appliance to enhance security of the KE System. The facility is responsible for installation and use of security appliance. Olympus has verified the Cisco ASA-5506-X. When using a model other than the Cisco ASA-5506-X, select a device that meets the following requirements:

- VPN server function equipped (L2TP or better)

- 3DES/AES-128 or greater for encryption method

- SHA-2 or greater for hashing method

- Compliant with FIPS 140-2 compliance requirements

NOTE: Olympus will not configure the security appliance, and can only give limited guidance with the models verified.

Additional information is found in the *Knowledge Exchange System (KE) V2.0 System Cyber Security Plan* (TR0137).

- Operation of the KE server with the following software HDD encryption has been verified:

    o McAfee Complete Data Protection (McAfee Endpoint Encryption for PCs 7.0.3)

    o BitLocker 6.3.9600

    NOTE: Perform HDD encryption to the entire KE server. Do not perform encryption to specific drive.

PROTOCOL CONVERTER

- **Moxa** NPort 5400 Series
- **RS-232 Ports:** Four Male DB9 Ports
- **RJ45:** One 10/100 Mbps Ethernet Port

BARCODE SCANNER

You can enter a patient ID by connecting a barcode scanner to a standalone workstation or a client PC. The barcode scanner must meet the following requirements:

- Use a barcode scanner designated as 'plug and play', which does not require software installed on KE hardware.
- The connection interface with the PC is USB.

BACKUP SOLUTIONS

Options for Backup

1. Olympus-provided solution:

   - Scheduled daily Olympus backup job to a network share or NAS.

   - Customer backs up a local folder created by the Olympus daily backup job.

     Backup location storage size must be capable of storage as stated in Table 1: Required HDD and External Storage Device**.**

2. Customer-provided solution:

   - Customer performs a complete server backup that allows complete restoration of the application (e.g., multiple day VM snapshots). Note that the customer is responsible for recovering backed-up content.

INCLUDED SOFTWARE FOR KE V2.0 SERVER

The following software is automatically installed in the KE server by installing the KE software.

- Adobe Acrobat Reader DC 2017.009.20044
- Java 7 Update 80
- Java SE Development Kit 7 Update 80
- Microsoft Visual C++ 2010 x64 Redistributable - 10.0.40219
- Microsoft Visual C++ 2010 x86 Redistributable - 10.0.40219
- Internet Information Services (IIS):
  IIS 7.5 is installed when OS is Windows 7.
  IIS 8.5 is installed when OS is Windows 8.1 or Windows Server 2012 R2

- Microsoft Visual C++ 2013 Redistributable (x86) - 12.0.30501
- Glassfish Server 4.1.2
- Microsoft .NET Framework 4.7
- Oracle Database 12c Enterprise Edition Release 12.1.0.2.0
- Oracle Client 12c Release 12.1.0.2.0

NOTE: If any of the following software is installed on your server, the KE software cannot be installed. Uninstall the following items prior to installation.

- Adobe Acrobat Reader DC
- Java
- Oracle Database

- Oracle Client
- Glassfish Server
- Internet Information Services (IIS)

SOFTWARE REQUIRED FOR THE KE CLIENT

The KE Client application can be used in the following web browsers:

- Internet Explorer 11.0.9600.17031 or subsequent versions
- Google Chrome 44.0.2403.107m or subsequent versions

NOTE: Microsoft Edge is not supported. Internet Explorer or Google Chrome is required to use the KE Client application. For information on versions supported by Olympus, contact your Olympus representative.

CONNECTIVITY CABLING, PORTS, AND DATA TRANSFER

Connect the KE server hardware to the facility's network. If you use the KE server's backup function, connect the KE server to the external storage device.

IP Address Settings:

<u>Do not</u> use DHCP settings for the KE server. Otherwise, the KE server cannot communicate with external devices. Instead, use a fixed IP address. You can, however, change the IP address of the KE client (you can also use DHCP settings for the KE client).

NOTE: Internet Protocol Version 6 (TCP/IPv6) is not supported. The KE System does not allocate a network drive space.

Operating System Settings:

Make sure the KE server and the KE client match each other on the following settings (see below). Otherwise, data communication may not work properly.

- Date and time settings

- Time zone settings

- Time synchronization with internet time server

- Wired LAN: Only 100 BASE-TX or 1000 BASE-T can be used as wired LAN standard. 1000 BASE-T is recommended to use for wired LAN. LAN cable must be Category 5 or greater (if you use 1000 BASE-T, must be Category 5e or greater).

- Wireless LAN: The KE client can be used by wireless LAN. Only IEEE802.11n, IEEE802.11a, or IEEE802.11g can be used as wireless LAN standard. Effective throughput of the wireless LAN (with browser cache) must be:

  o Large server: 8.8 Mbps or greater

  o Small server: 4.7 Mbps or greater

  o Mini server, Standalone workstation: 3.6 Mbps or greater

Port Settings:

Port must be dedicated for use of KE System. Do not use a well-known port, and a dynamic port. Open a port in the Windows Firewall after installing the KE software. Ports used for the KE System are as follows:

(*) Asterisks in this table indicate that the port numbers are specified by default and can be customized by the facility.

Table 2: Port Settings

Protocol (TCP/UDP)	Send/Receive	Port Number	Details	Open a port in Windows Firewall (X = Port is pre-configured to be 'enabled' during KE installation)
TCP	Receive	80	Internet Information Services (IIS)	X
TCP	Receive	104	CV Interface (Storage Service)	X
TCP	Receive	443	IIS	X

Protocol (TCP/UDP)	Send/Receive	Port Number	Details	Open a port in Windows Firewall (X = Port is pre-configured to be 'enabled' during KE installation)
TCP	Receive	1158	Database Interface	
TCP	Receive	1521	Database Interface	
TCP	Receive	2251*	HL7 Communication (ORM, OMG, SIU)	X
TCP	Receive	3700	Application Server	
TCP	Receive	3938	Database Interface	
TCP	Receive	4848	Application Server	
TCP	Receive	7676	Application Server	
TCP	Receive	8036	CV Interface (Internal Communication)	
TCP	Receive	8075	DICOM Communication (Internal Communication)	
TCP	Receive	8076	DICOM Communication (Internal Communication)	
TCP	Receive	8080	Application Server	
TCP	Receive	8109	HL7 Communication (Internal Communication)	
TCP	Receive	8686	Application Server	
TCP	Receive	9994	CV Interface (MWM Service)	X
TCP	Receive	9995	CV Interface (ECHO Service)	X
TCP	Receive	9996	CV Interface (MPPS Service)	X
TCP	Receive	9998	CV Interface (COMMITMENT Service)	X
TCP	Receive	51900	CV Interface (Send/Receive with CPoE)	X
TCP	Receive	51901	CV Interface (Send/Receive with CPoE)	X
TCP	**Send**	**104**	CV Interface (N-EVENT-REPORT Service)	
TCP	**Send**	**2531***	HL7 Communication (ORU)	

Protocol (TCP/UDP)	Send/Receive	Port Number	Details	Open a port in Windows Firewall (X = Port is pre-configured to be 'enabled' during KE installation)
TCP	Send	3250*	DICOM Communication (C_FIND Interface for MWM)	
TCP	Send	3350*	DICOM Communication (C_STORE Interface for Image Transfer)	
TCP	Send	4001*	OER Interface	
TCP	Send	4002*	OER Interface	
TCP	Send	4003*	OER Interface	
TCP	Send	4004*	OER Interface	
TCP	Send	51900	OER Interface	

REMOTE SUPPORT SERVICE

Remote Support Services for the KE server is available via Remote Support Services R7 (SecureLink®). The following three (3) ports need to be open:

TCP 443, 9722, 80

INTERFACES

- KE System supports HL7 (worklist import and exam image export). Refer to *HL7 Specification for Olympus KE* for details. The following HL7 versions are supported:
    - 2.3.1
    - 2.4
    - 2.5
- KE System supports DICOM (worklist import and exam image export). Refer to the *Olympus KE DICOM Gateway Conformance Statement* for details.

You cannot have both HL7 Inbound and a DICOM Modality Worklist configured simultaneously.

UPDATES AND PATCHES

Olympus will verify updates and patches monthly for the following products to be compatible with the KE System. Validated monthly patches are found on http://medical.olympusamerica.com/KnowledgeExchangeSystem.

- Microsoft Windows updates
- Adobe Acrobat Reader DC
- Microsoft Internet Explorer
- Google Chrome
- Microsoft .NET Framework
- Microsoft Internet Information Services (IIS)

If the software update causes an error, contact Olympus.

NOTE: Do not update Java, Glassfish Server, Oracle Database, or Oracle Client.

ANTIVIRUS EXCLUSIONS

Installing Antivirus Software:

It is the facility's responsibility to install antivirus software. The following directories must be excluded from virus scans on KE servers, and standalones; otherwise, performance may be affected.

Large Server/Small Server/Mini Server/Standalone Workstation	Directory
Exclude	*<drive>*:\ **Olympus**

REQUIRED USER ACCOUNTS

The facility must create a Windows user account with administrative privileges to be used for installation, configuration, and backups. This account must remain active or the KE system will not work properly.

DOMAIN

Check for Active Directory user names that are identical to the KE computer name. Rename any identical names in Active Directory. The KE computer name and the user names in Active Directory cannot be the same.

When connecting the KE server to a domain, it is the facility's responsibility to configure the domain security policy to not include automatic software pushes.

- Server software installation requires administrative privileges and the use of a local administrator account.
- When joining to a facility domain, place in a Domain Organizational Unit where no domain policies are applied during the installation phase.
- Do not alter the computer name of the KE after installation. Otherwise, the KE System will not function properly. However, you can change the computer name of the KE client (use only alphanumeric characters for the computer name).

NOTE: **If you need to change the OU to an OU that has policies, after the installation, consult with your Olympus field representative, as this may affect application functionality.**

MAXIMUM CONNECTABLE DEVICES

Large Server

Connectible Device:	Maximum Connectable Devices:
▪ CV (CV-190/CV-290)	25
▪ OER-Pro	40
▪ Protocol Converter	16
▪ Concurrent Web Access	20
▪ PACS	3
▪ RIS	3
▪ EMR	1

Small Server

Connectible Device:	Maximum Connectable Devices:
▪ CV (CV-190/CV-290)	10
▪ OER-Pro	16
▪ Protocol Converter	6
▪ Concurrent Web Access	10
▪ PACS	2
▪ RIS	2
▪ EMR	1

MAXIMUM CONNECTABLE DEVICES (CONT.)

Mini Server

Connectible Device:	Maximum Connectable Devices:
▪ CV (CV-190/CV-290)	4
▪ OER-Pro	4 *
▪ Protocol Converter	2
▪ Concurrent Web Access	4
▪ PACS	2
▪ RIS	2
▪ EMR	1

Standalone Workstation

Connectible Device:	Maximum Connectable Devices:
▪ CV (CV-190/CV-290)	4
▪ OER-Pro	4 *
▪ Protocol Converter	2
▪ PACS	2
▪ RIS	2
▪ EMR	1

*If a CV unit is not connected to the KE server, then a maximum eight (8) devices are connectable.

NOTE: The standalone workstation does not support web client connections.

3500 Corporate Parkway, P. O. Box 610,

Center Valley, PA 18034

Fax: (484) 896-7128 Telephone: (484) 896-5000

OLYMPUS®