

Capsule Surveillance

Capsule Surveillance consists of multiple components which are typically run on a cluster of interconnected virtual servers. The number of servers depends on the size and complexity of your installation, with larger installations splitting the services across a wider array of servers.

- The application server manages the Capsule Surveillance application services.
- The database server holds the data taken in by Capsule Surveillance from connected devices.
- The pollster server hosts data ingestion or acquisition services, which are referred to as pollsters.
- The web server supports the delivery of information to workstations and the remote display.
- The virtual server requirements are ultimately dependent upon the number of devices connected, as well as the number and types of waveform data and the volume of data from those devices.

Capsule Surveillance server resources for typical (medium) deployment

Application server (includes onboard pollster)

Component	Requirements/recommendations
Processor	16 vCPU (Intel Xeon Platinum 8272CL or equivalent)
RAM	32 GB
Hard drives	Required free hard disk space: 500 GB

Web server (includes onboard pollster)

Component	Requirements/recommendations
Processor	16 vCPU (Intel Xeon Platinum 8272CL or equivalent)
RAM	32 GB
Hard drives	Required free hard disk space: 100 GB

Database server

Component	Requirements/recommendations
Processor	8 vCPU (Intel Xeon Platinum 8272CL or equivalent)
RAM	16 GB
Hard drives	Required free hard disk space: 300 GB

Capsule Surveillance server resources for medium deployment (continued)

Pollster server (standalone)

Component	Requirements/recommendations
Processor	8 vCPU (Intel Xeon Platinum 8272CL or equivalent)
RAM	16 GB
Hard drives	Required free hard disk space: 100 GB

Note: With deployments fewer than 31 beds and deployments greater than 350 beds, refer to the Capsule Surveillance System Requirements and Recommendations document for server requirements/recommendations.

Capsule Surveillance server software

For the Capsule Surveillance server software, the minimum requirements are identical to the recommended configuration of the database server.

Component	Requirements/recommendations
Operating system	Windows Server 2016, 2019, or 2022 English (US locale, only standard and datacenter editions installed with desktop experience)
.NET	Microsoft .NET Framework 4.8 .NET Core Desktop Runtime 6.0.9
Web server	Internet Information Services (IIS) web server
Browser	<ul style="list-style-type: none">Edge 90.X and laterChrome 90.X and laterSafari 12.X and later <i>Note: It is strongly recommended that you keep your Internet browser updated to the most recent version.</i>
Authentication system (optional)	Minimum active directory functional level: Microsoft Windows Server 2003

Database server

The database server is required when using Capsule Surveillance.

Note: You do not need a dedicated server for Capsule. However, the server must meet the requirements described here.

Component	Requirements/recommendations		
Processor	Small 4 vCPU	Medium 8 vCPU	Large 8 vCPU
RAM	8 GB	16 GB	16 GB
Free hard disk space	300 GB	300 GB	300 GB
Database server software	SQL Server 2017 or 2019 including Microsoft Server Management Studio 17 <i>Note: To access the database, Capsule recommends installing the latest version of the SQL Server Management Studio on the Capsule Server. This software is available from Microsoft.</i>		

Network

Network infrastructure that supports 1 Gbps

Note: Capsule Medical Device Information Platform (MDIP) and the Capsule Surveillance software will require separate hosting servers.

Note: Interconnection between VMs in a cluster (especially connectivity between the application server and the database server) are recommended to use multi-gig connections to reduce latency.

MDIP compatibility

Capsule MDIP and Capsule Surveillance will require additional setup work to be integrated in the same hospital network.

Note: For waveform data, MDIP 2022-1 is required. Capsule Surveillance is only compatible with earlier versions of MDIP for simple data points.

Capsule Surveillance workstation

Workstation hardware

The following hardware has been certified for 60601-1-8:

Configuration 1

- Dell 27 4K USB-C – P2721Q Screen

Configuration 2

- Dell 27 4K USB-C – P2721Q Screen
- Slim Dell SB521A Soundbar (audio source)

Capsule Surveillance can run on other hardware as long as it meets the minimum requirements listed below.

Component	Requirements/recommendations													
Processor	Quad core processor – 64-bit													
RAM	8 GB													
File system type	NTFS													
Screen resolution	<ul style="list-style-type: none"> • 22" → 4x4=16 patient locations. Typically Full HD (1920x1080 or 1920x1200) • 24" → 5x5=25 patient locations. Typically QHD (2560x1440) • 27" → 6x6=36 patient locations. Typically UHD (3840x2160) or 4K (4096x2160) <p>This is configurable both globally and per workstation in the configuration dashboard. Make sure that the Windows zoom is set to the default 100%.</p>													
Audio	<p>Minimum requirements: Frequency response from 150Hz (or lower) to 16kHz (or higher) Maximum sound pressure level 70 dB(A) at 1 meter (3.3 feet)</p> <table border="1"> <thead> <tr> <th>Alarm priority level</th> <th>Typical measured sound pressure level at 100% maximum volume</th> <th>Typical measured sound pressure level at 30% maximum volume</th> <th rowspan="4">Measurements to be performed to IEC 60601-1-8 published standard, at 1 m (3.3 ft). Background noise must be at least 6 dB(A) below lowest measured value.</th> </tr> </thead> <tbody> <tr> <td>High</td> <td>74 dB(A)</td> <td>56 dB(A)</td> </tr> <tr> <td>Medium</td> <td>67 dB(A)</td> <td>47 dB(A)</td> </tr> <tr> <td>Low</td> <td>62 dB(A)</td> <td>42 dB(A)</td> </tr> </tbody> </table>	Alarm priority level	Typical measured sound pressure level at 100% maximum volume	Typical measured sound pressure level at 30% maximum volume	Measurements to be performed to IEC 60601-1-8 published standard, at 1 m (3.3 ft). Background noise must be at least 6 dB(A) below lowest measured value.	High	74 dB(A)	56 dB(A)	Medium	67 dB(A)	47 dB(A)	Low	62 dB(A)	42 dB(A)
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Network	Ethernet 1 Gbps													

Note: IEC 60601-1-8 is the International Electrotechnical Commission standard of safety and essential performance requirements and tests for medical alarm systems.

Capsule Surveillance workstation software

Component	Requirements/recommendations
Operating system	Windows 10 Enterprise Available for the following language and locale: <ul style="list-style-type: none">• (English only, US locale)
.NET	.NET Core Desktop Runtime 6.0.9
Additional requirement	Visual C++ redistributable for Visual Studio 2015-2019 x64
Recommendation	Install antivirus in accordance with hospital cybersecurity policy

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