



NODE™ SERVER HARDWARE

HP ProLiant DL360p Gen 8

CPU:	2x Intel Xeon E5-2667, 2.90GHz
Chipset:	Intel C600 Chipset Series
RAM:	ECC DDR3 32 GB (8x4 GB)
HDD:	4x 300 GB SAS hot-plug HDD, 10,000 RPM (up to 1.5 TB total HDD capacity possible)
RAID:	RAID5 incl. hot spare with flash buffered write cache (2 GB)
Graphics:	NVIDIA Quadro 2000 1 GB
LAN:	1x Quad Port Multifunction Gigabit Network Server Adapter (HP 331FLR)
HW Monitoring:	iLO4 Standard
Height:	1.7" (4.32 cm)
Width:	17.11" (43.47 cm)
Length:	27.5" (69.85 cm)
Weight:	19.2 kg (42.33 lb)
Operating System:	Windows Server 2008 SP2 64 bit

- 1x DVD writer for data archiving
- Dual 1200 W power supply (hot-plug) for redundancy
- 6x hot-plug fans
- 1U 19" Rack mount with telescopic rails

IMPORTANT: The Brainlab Node Server Hardware is an application server. It is not intended to provide a solution for PACS, data backup or long term data storage.

SYSTEM REQUIREMENTS FOR 3rd PARTY SERVERS

Brainlab Origin™ Server Software can be installed on a 3rd party hardware platform or virtual machines if hardware and operating system prerequisites are fulfilled. For further questions or assistance please contact Brainlab support.

Note: only Brainlab applications may be installed and operated on the server!

STORAGE

2 volumes partitioning:

C:\ min. 80 GB for OS

F:\ min. 100 GB for applications & data

Used applications disk space:

1 GB to 4 GB

SERVER HARDWARE

CPU: 2x Intel Xeon E5-2667 (12 cores), 2.90GHz or equivalent

RAM: 16 GB or higher

Graphics: Manufacturer: NVIDIA
Model: Quadro 2000 or newer (2012 or newer) *
GPU Architektur: Fermi or newer
Dedicated Video RAM: 1 GB or more
Shader Model 5.0 or higher
Microsoft Direct X 11 or higher **
Driver Version: 331.82*** (or newer)

LAN: 100 Mb/s Network Adapter

** IMPORTANT: The NVIDIA Quadro 2000 graphic card requires an additional cable connection for internal power supply when used in a 3rd party server configuration. This cable is server model specific and not included in a standard server configuration.*

*** The following windows update must be installed: [KB971512](#) „The Windows Graphics, Imaging, and XPS Library“ and [KB2117917](#) „Platform Update Supplement for Windows Vista and for Windows Server 2008“*

**** Driver versions may change according to application requirements.*

VIRTUAL MACHINES

The server will host highly CPU and RAM demanding software. Consider that a virtual CPU (vCPU) is roughly comparable to a physical core or depending on the configuration of the Hypervisor Operating System even only to one of the two HyperThreading units of one physical core and not to a whole physical CPU socket with multiple cores. Brainlab tests the Node™ platform for a maximum density of 5 concurrent sessions. For virtual machines the sessions' density is affected by the virtualization platform performance which cannot be known in advance for a virtual machine. Therefore Brainlab cannot guarantee the same session density with a performance equivalent to the dedicated hardware platform.

For the iPlan IGS product family starting with version 3.0.6 the Advanced 3D graphics views are supported for virtual machines if a virtual GPU (vGPU) or GPU pass-through based on a dedicated physical NVIDIA graphics card (e.g. NVIDIA GRID K2) in the VM Host is available together with a recent graphics driver on the VM Host and the VM itself (NVIDIA driver versions > 340.66).

Brainlab Elements software offer advanced 3D with and without physical graphics adapter available. In absence of a graphics card for both iPlan and Elements software the standard 3D graphics quality will not be affected, but a lower performance and higher CPU usage must be expected due to the software rendering processes. The Elements DICOM Viewer 3D option is also supported on virtual machines.

Both the MAC and IP address must be configured as static and the virtual machine must run on the same server host without dynamically roaming to other servers (load balancing).

Minimum VM Configuration for 5 concurrent user sessions:

vCPU:	12 x 2.9 Ghz or equivalent
vRAM:	16 GB (32 GB for RT workflows)
Graphics:	Required only for high 3D performance – see HW requirements
LAN:	100 Mb/s Network Connection

SERVER SOFTWARE REQUIREMENTS

Operating System (OS)	Only Windows Server 2008 Standard SP2 64bit (Operating System language must be English), and TS client access licenses****
.NET Framework	Microsoft .NET Framework 4.5 (necessary for Brainlab Elements)

**** *The Windows Server 2008 license as well as the TS client access licenses (TS CALs) have to be provided by the hospital IT.*

HOSPITAL ENVIRONMENT REQUIREMENTS

CLIENT COMPUTER

Minimum

OS:	Windows XP with SP2, Windows XP with Service Pack 3 or newer MAC OS X 10.8 or newer
CPU/RAM:	1GHz, 512 MB
Display resolution:	1280x1024 landscape format
Display color depth:	24 bit

Recommended

OS:	Windows 7
CPU/RAM:	2 GHz, 2GB
Display resolution:	1920x1200 landscape format
Display color depth:	32 bit

Browsers for HTML5 connection:

Safari version:	> 6
Chrome version:	> 35
Firefox version:	> 30

Browsers for RDP connection:

Internet Explorer 8.x or newer, RDP client 6.0.6 and ActiveX control enabled for Node URL

TABLET COMPUTER

- iPad with iOS 7.0 or higher
- Display resolution: 1024x768
- Display color depth: 24 bit
- HTML5 compatible web browser (recommended for full screen capability: e.g. Atomic Web, Mercury, Google Chrome)

HOSPITAL NETWORK

- Existing LAN with minimum 100 Mbit/s bandwidth or higher speed and less than 50 ms latency
- For wireless client connection: Wireless LAN must be provided by the hospital
- The server needs to be installed in an air-conditioned IT industrial standard environment (max 35 °C)
- Data storage solution for long term archiving

OPERATING SYSTEM CONFIGURATION SPECS

The customer is responsible for preparing the Operating System configuration on the host device according to this document. Brainlab Service shall be provided with a device administrative account to perform the necessary Brainlab Software installation.

Server Roles

These server roles must be installed:

- File Services
- Network Policy and Access Services
- Terminal Services*
- Web Server (IIS)

Server Features

These server features must be installed:

- Windows update KB971512 and KB2117917
- .NET Framework 4.5
 - XPS Viewer
- BITS Server Extensions
- Remote Server Administration Tools
 - Role Administration Tools
- Terminal Services Tools (all)
- Web Server (IIS) Tools (all)
 - Feature Administration Tools
- BITS Server Extensions Tools
- RPC over HTTP Proxy
- Telnet Client
- Windows PowerShell
- Windows Process Activation Service
 - Process Model
 - .NET Environment
 - Configuration APIs

File Services – Role Services

These role services for the File Service must be installed:

Role Services: 1 installed	
Role Service	Status
File Server	Installed
Distributed File System	Not installed
DFS Namespaces	Not installed
DFS Replication	Not installed
File Server Resource Manager	Not installed
Services for Network File System	Not installed
Windows Search Service	Not installed
Windows Server 2003 File Services	Not installed
File Replication Service	Not installed
Indexing Service	Not installed

Network Policy and Access Services – Role Services

These role services for the Network Policy and Access Services must be installed:

Role Service	Status
Network Policy Server	Installed
Routing and Remote Access Services	Not installed
Remote Access Service	Not installed
Routing	Not installed
Health Registration Authority	Not installed
Host Credential Authorization Protocol	Not installed

Terminal Services - Role Services

The following role services for the Terminal Services must be installed:

Role Services: 3 installed	
Role Service	Status
Terminal Server	Installed
TS Licensing	Installed
TS Session Broker	Not installed
TS Gateway	Installed
TS Web Access	Not installed

Note: where not required Licensing and Gateway services can be omitted.

Web Server (IIS) - Role Services

These role services for the Web Server (IIS) must be installed:

Role Service	Status
Web Server	Installed
Common HTTP Features	Installed
Static Content	Installed
Default Document	Installed
Directory Browsing	Installed
HTTP Errors	Installed
HTTP Redirection	Installed
Application Development	Installed
ASP.NET	Installed
.NET Extensibility	Installed
ASP	Not installed
CGI	Not installed
ISAPI Extensions	Installed
ISAPI Filters	Installed
Server Side Includes	Not installed
Health and Diagnostics	Installed
HTTP Logging	Installed
Logging Tools	Installed
Request Monitor	Installed
Tracing	Installed
Custom Logging	Not installed
ODBC Logging	Not installed
Security	Installed
Basic Authentication	Installed
Windows Authentication	Installed
Digest Authentication	Not installed
Client Certificate Mapping Authentication	Installed
IIS Client Certificate Mapping Authentication	Not installed
URL Authorization	Not installed
Request Filtering	Installed
IP and Domain Restrictions	Not installed
Performance	Installed
Static Content Compression	Installed
Dynamic Content Compression	Not installed
Management Tools	Installed
IIS Management Console	Installed
IIS Management Scripts and Tools	Installed
Management Service	Not installed
IIS 6 Management Compatibility	Installed
IIS 6 Metabase Compatibility	Installed
IIS 6 WMI Compatibility	Installed
IIS 6 Scripting Tools	Installed
IIS 6 Management Console	Installed
FTP Publishing Service	Not installed
FTP Server	Not installed
FTP Management Console	Not installed

Terminal Services Configuration – RDP / Tcp Properties

The default Security settings for the OS Image on Brainlab iPlanNet HW are:

- Security Layer: Negotiate (as alternative it is possible to use RDP Security Layer)
- Encryption level: FIPS Compliant
- Allow connections only from computers running remote Desktop with Network Level Authentication should be disabled.

For HTML 5 connections, Ericom Access Server component requires access to native RDP to be enabled on the RDP host. For this reason leave the setting on Negotiate or change it to RDP Security Layer.

