



PHILIPS

Radiation oncology

Treatment Planning

Pinnacle SmartEnterprise

Centralized computing platform

X6-2 specifications sheet

Scalable capacity and robust healthcare IT integration for high volume clinics

Built for high volume clinics, the Pinnacle SmartEnterprise moves treatment planning **from the desktop to the data center**, enhancing accessibility, reliability and performance, while reducing maintenance and management of the system.

Key advantages

Centralized computing performance

Designed for multiple users with parallel, simultaneous workflows

Distributed access

Access Pinnacle wherever and whenever it is needed

Reduced operational costs

Simplify software installation and ongoing maintenance

The power of **centralized computing** in a **scalable solution**

Centralized computing performance

Designed for the demands of multiple, parallel, simultaneous workflows, each user has the same processing power to get their work done as efficiently as possible.

Distributed Access

Pinnacle is accessed through the existing Windows or Macintosh PCs* of the clinic with a Virtual Client Connection (VCC). A VCC is a low bandwidth, small footprint, remote client that allows clinicians the flexibility to work from wherever they are needed. Adding another access point for a Pinnacle user is as easy as installing a VCC.

Reduced operational costs

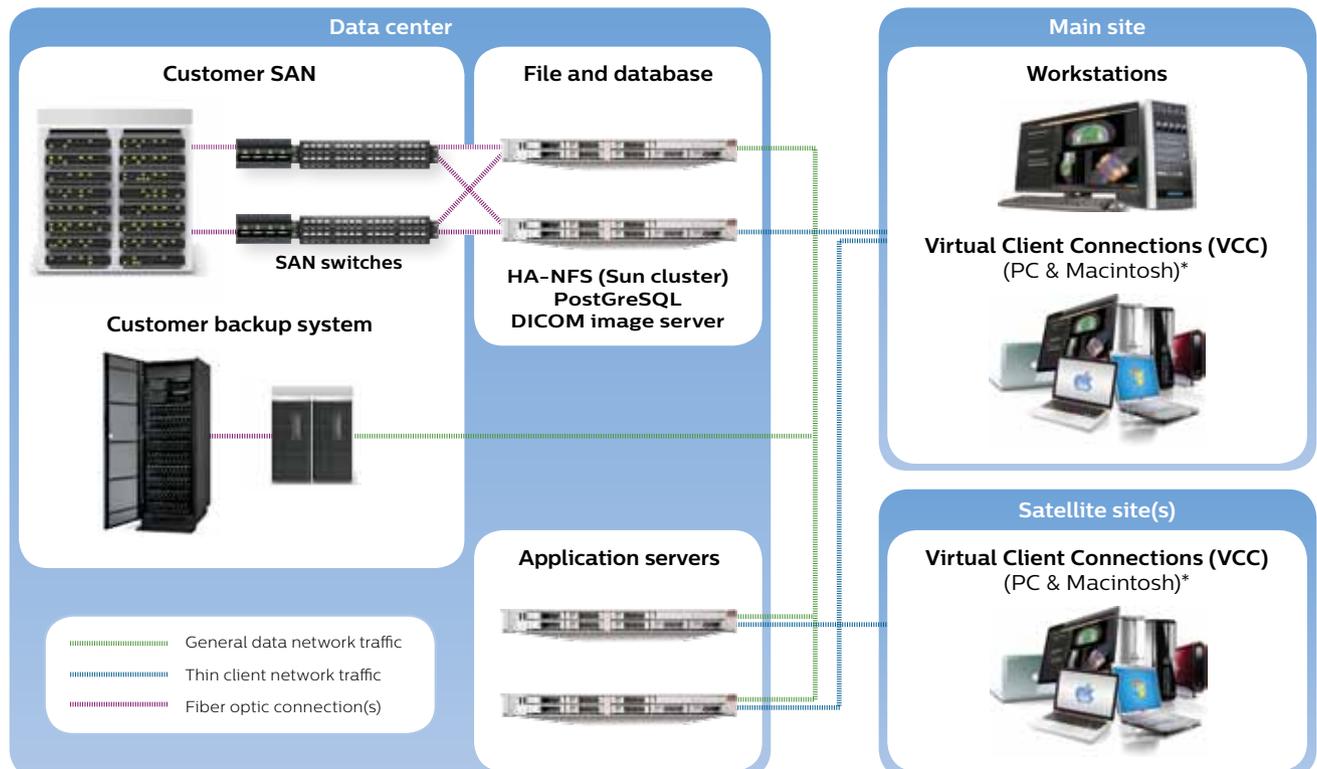
A centralized server simplifies software installation and updates, and ongoing maintenance, virtually eliminating the need for individual maintenance of desktops. As new licenses are added to the Pinnacle system, because it's a centralized server, those users gain access to that functionality immediately.

The system is made up of four key components:

- 1. Server cluster** – Philips-supplied fileservers with automatic failover capability
- 2. Application servers** – Philips-supplied application servers that run the Pinnacle application
- 3. Access points** – Customer-supplied PCs or Macs* where end users access the Pinnacle application
- 4. Data storage** – On a customer-supplied SAN

*Macintosh support for English, French, German, and Dutch localized keyboards only.

Pinnacle SmartEnterprise deployment



Network switching and routing is provided by customer and is assumed throughout this diagram. All pictured data center network connections can use IPMP or aggregation for redundancy.

* Supports English, French, German, and Dutch localized keyboards only.

System specifications

	Server nodes (filesaver)	Pinnacle application server
OEM model	Oracle* X6-2	Oracle X6-2
CPU	One Intel® Xeon® E5-2643 v4 6-core 3.4 GHz processor	Dual Intel® Xeon® E5-2699 v4 22-core 2.2 GHz processor
RAM	64GB DDR4	64GB DDR4: upgradable to 384GB
Clustering software	Oracle Solaris Cluster (Sun Cluster)	N/A
Operating system	Oracle Solaris 11.3	Oracle Solaris 11.3
Intel turbo boost and hyperthreading	Yes	Yes
HBA	Sun Storage Dual 16 Gb Fibre Channel PCIe Universal HBA, Emulex	N/A
HBA ports and supported speeds	2 ports per server node 4 GB/s, 8 GB/s, 16GB/s Minimum recommendation of 800 IOPS with a targeted 10k write speed	N/A
Hard drives	2x 600 GB 10K rpm 2.5-inch SAS-3 HDD (mirrored/RAID1)	5x 1.2TB 10k RPM SAS-3 (RAID 5)
Ethernet ports	4x 10,000/1,000/100 Mbps Base-T Ethernet ports	4x 10,000/1,000/100 Mbps Base-T Ethernet ports
Remote Management Port (ILOM)	1x 10,000/1,000/100 Mbps Base-T Ethernet ports (for remote management/support)	1x 10,000/1,000/100 Mbps Base-T Ethernet ports (for remote management/support)
Required Ethernet switch ports (customer provided)	1 or 2 for network connections (2 if using recommended redundant network configuration); 1 for ILOM port	
Size	1 U Height: 42.6mm (1.7in) Width: 436.5mm (17.2in) Depth: 737.0mm (29.0in) Weight: 18.0kg (40.0lb)	1 U Height: 42.6mm (1.7in) Width: 436.5mm (17.2in) Depth: 737.0mm (29.0in) Weight: 18.0kg (40.0lb)
Rack mounting	Slide rail kit and cable management arm included	
Peak heat load	897 BTU/hour	1,497 BTU/hour
Peak power	263 W	550 W
Operating environment	5°C to 31°C (41°F to 95°F); 10%–90%, non-condensing Up to 3,000 m, maximum ambient temperature is derated by 1°C per 300 m above 900 m	
Acoustic noise	7.0 Bels A-weighted operating, 7.0 Bels A-weighted idling; 63.1 dBA operating, 60.5 dBA idling; systems must be acoustically isolated from staff work areas.	
Power supply	Dual-redundant Sun 760W AC HE Gold Power Supplies 100–240 VAC, 50 or 60 Hz; IEC 320-C13 power connector	
Current draw	2.4 A @ 110 VAC 1.2 A @ 220 VAC	4.0 A @ 110 VAC 2.0 A @ 220 VAC
Power cords	Philips will supply power cords to match the local power outlet, or jumper cables to fit IEC 320-C14 rack PDU power sockets.	

Firewalls and ports

General	The Pinnacle SmartEnterprise system can function correctly in an environment with firewalls, provided that the necessary ports are opened between the systems. The production network connections between server cluster nodes and Pinnacle application servers must be on the same subnet, with no firewalls between these systems. Connectivity in and out of these systems is described in later sections.
VCC and Thin Clients	<p>Sun Ray server software: TCP and UDP ports 7009, 7013, 7777</p> <p>Sun Ray load-balancing: TCP and UDP ports 7011</p> <p>Sun Ray graphics: TCP and UDP ports 32768 – 65535 – 69/udp (for firmware updates)</p> <p>ICMP: ICMP (recommended to be enabled for troubleshooting)</p> <p>contact Philips technical support for further questions</p>
ILOM management port requirements	<p>The management network connection requires the following ports to be open between the client (a web browser on the health care facility network) and the Integrated Lights-Out Management interface on the server:</p> <ul style="list-style-type: none"> • HTTP/HTTPS: TCP ports 80 and 443 (HTTP automatically redirects to HTTPS) • SSH: TCP port 22 • Console – CD Redirection: TCP port 5120 • Console – Keyboard and mouse: TCP port 5121 • Console – Encryption: TCP ports 5555 and 5556 • Service Tag Daemon: TCP port 6481 • Console – Video: TCP port 7578 • ICMP: ICMP (recommended to be enabled for troubleshooting)
DICOM import and export	<p>The firewall must be open to allow devices to push images into the Pinnacle system. The Pinnacle DICOM listener will operate on the server cluster virtual IP address by default, using TCP port 104.</p> <p>The firewall must additionally be open to allow each Pinnacle application server and workstation to initiate connections to push data into record and verify systems and other treatment planning systems. The DICOM protocol operates on TCP port 104 by default, although this may vary depending on the configuration of the customer-owned target system.</p> <p>All ports pertaining to NIS/YP and NFS are required if firewalls exist between the server and any attached clients.</p> <p>TCP/UDP 111, TCP/UDP 4045, TCP/UDP 2049, and stateful RPC packet inspection which can monitor client requests for NFSv3 and NIS ports, dynamically opening the associated random ports.</p> <p>The firewall must allow each Pinnacle application server and each Pinnacle workstation to initiate connections to all printers.</p> <p>The ports used for printing will depend on the protocol used to access the customer-owned printers.</p>
Enterprise backup	The firewall must allow the server cluster nodes (and virtual IP address) to communicate with the customer's enterprise backup system. The required ports are dependent on the enterprise backup system deployed.
Data transfer at installation	For existing customers with data to be migrated from a workstation server onto the server cluster, the firewall will need to be opened between the server cluster (individual nodes and virtual IP) and the customer's existing server. This requirement is temporary, unless the customer will be keeping the workstation and converting it into a client to the newly installed system.
Remote support	<p>For faster problem resolution, a significant number of support calls can be resolved remotely via the Philips Remote Services (PRS). This is a VPN-based connection accomplished with either a Philips-provided router, or a configuration to an existing customer-managed VPN concentrator. The following systems and ports must be authorized for Philips to provide remote support:</p> <ul style="list-style-type: none"> • Server cluster node: TCP port 22 (for server cluster nodes only, not virtual IP) • ILOM ports: TCP ports 443, 5121, 5555, 5556, 6481, 7578 • Workstation (thick-client): TCP port 22

SmartEnterprise storage requirements and specifications

Compatible SANs	See Oracle.com for the Oracle Solaris Cluster storage partner program data-sheet. 1. Storage solutions MUST indicate compatibility with X6-2 and Cluster 4.x 2. Storage solutions that require a Solaris Operating System patch are NOT compatible. 3. Customer to provide 4 fibre patch cables
Supported storage connection type	Only fiber-connected storage is supported
Optical connector type	LC
Number of virtual disks/LUNs	Minimum of 1 patient storage LUN and 1 archival storage LUN

Advanced Connectivity

Active Directory	Philips recommends the server installation of a compatible Solaris active LDAP agent (not included) to allow the use of your existing active directory servers. All LDAP vendors are subject to approval for use by Philips customer support.
SMB Sharing Services	Share files and directories to Windows devices. Contact Philips customer support for further details.

Access points

Virtual Client Connection (VCC)	
PC/Macintosh hardware	Not included (user provided)
Minimum specifications	<ul style="list-style-type: none"> • Windows: minimum specifications as required by Microsoft Windows 7*, XP or Vista (32 and 64 bit) • Macintosh: OS X v10.6 (Snow Leopard) (English, French, German, and Dutch localized keyboards only) • Disk space: 100 MB to load emulation application • Display resolution: 1280 x 1024 or better with dual monitor support • 10 Mb/s network with less than 15 ms latency

Backup

Philips recommends the server installation of a compatible backup agent (not included) to allow the use of your existing enterprise backup system. You will be required to create schedules and handle all operational responsibilities regarding backup (e.g., monitoring backups and rotating tapes).

Support can be provided by the Philips installation representative, and Philips will provide an acceptance verification procedure to ensure that Pinnacle is operating properly after backup agent installation.

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1. 100 MB of available disk space is required.

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