PHILIPS

Pinnacle³

Expert

The power of centralized computing in a compact package

Philips Pinnacle³ Expert specifications

Designed specifically to meet the needs of the small clinic, Expert is an affordable, high-performance system enabling efficient treatment planning from virtually anywhere.

Key advantages

- **Faster treatment planning**
  Improved computation speeds by up to 480%[1]

- **Improved access**
  Seamless access to all Pinnacle³ applications and improved performance

- **Reduced operational costs**
  Eliminates the need to support multiple workstations in the Pinnacle³ network

An affordable, high-performance system enabling efficient treatment planning from virtually anywhere

The demand for more efficient treatment planning is increasing.

Even the smallest centers are adopting sophisticated treatment techniques to improve patient care and remain competitive. As clinicians become more and more mobile, there is an increased demand for fast and reliable remote access. Pinnacle³ Expert provides an affordable, high-performance solution without the high costs of IT support.

Everyone gets the power of the server and access to all Pinnacle³ applications – regardless of log-in location.

Plan faster with Pinnacle³ Expert.

Calculation speeds are of the utmost concern, particularly for computationally intensive tasks such as SmartArc planning. Pinnacle³ Expert is powered by advanced Intel Xeon* processors, resulting in greatly improved system performance and **speed improvements of up to 480% versus the 810 and up to 240% versus the 810X.**[1]
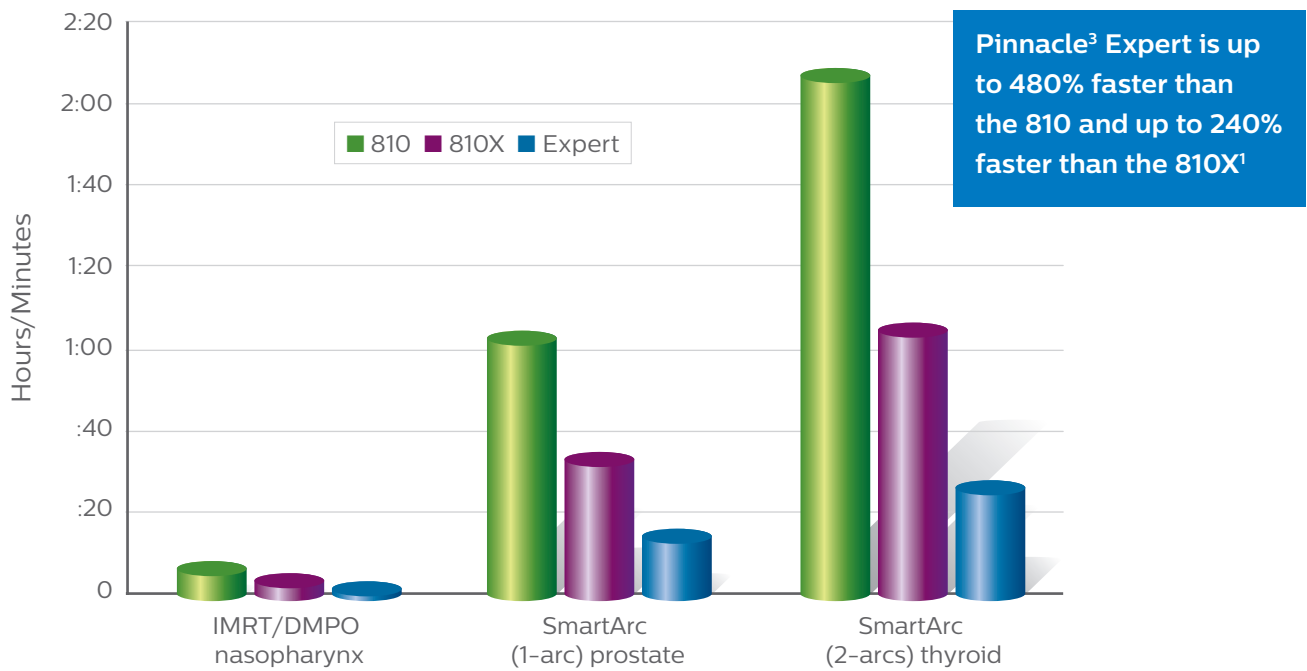
Improve user access.

- Access all Pinnacle³ functionalities from a variety of PC and Macintosh devices.[2,3]
- Low bandwidth network requirements help facilitate robust connectivity during sessions
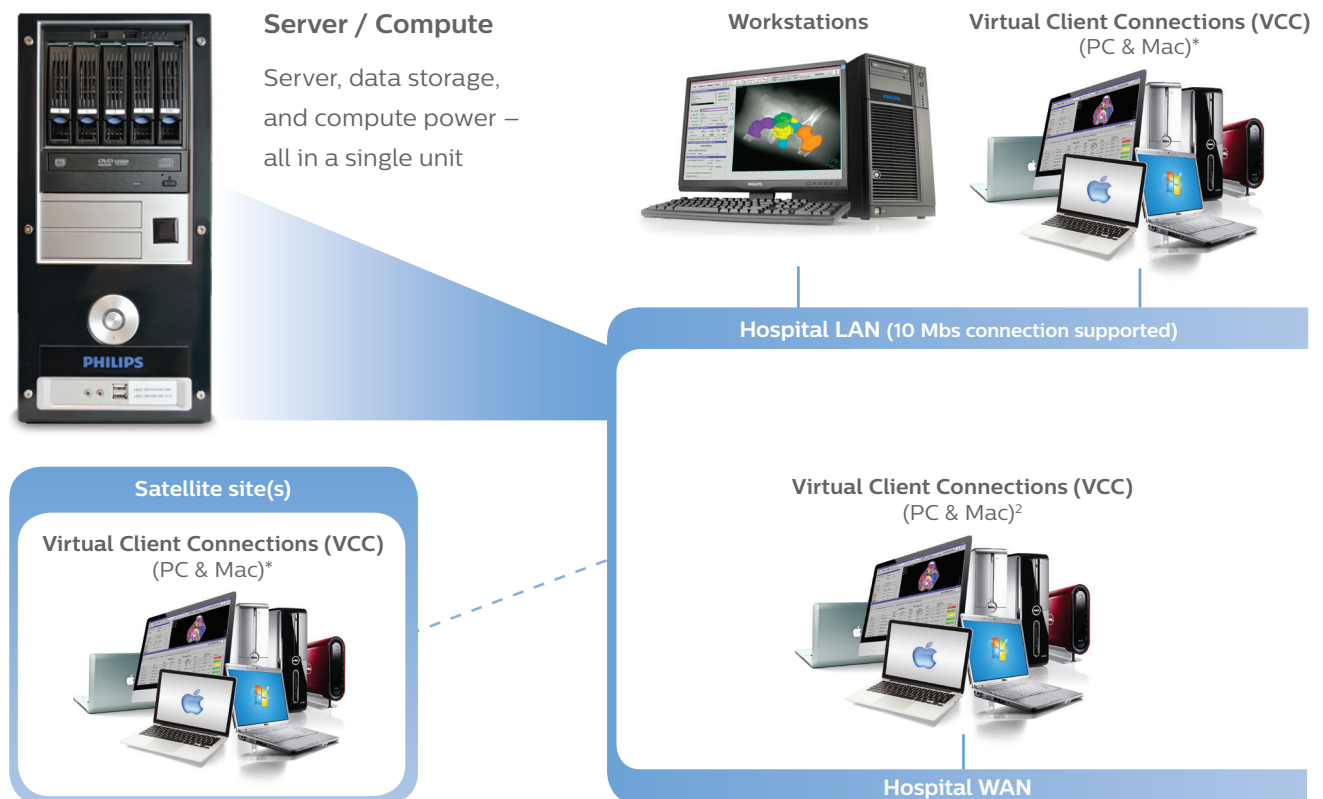
Reduce operational costs.

- Eliminate the need to support multiple workstations in the Pinnacle³ network
- Leverage existing PC and Macintosh computers as client access points
- Manage an entire Pinnacle³ network from one server

Pinnacle³ Expert performance comparison[4]

Hours/Minutes

- 810
- 810X
- Expert

Pinnacle³ Expert is up to 480% faster than the 810 and up to 240% faster than the 810X[1]

IMRT/DMPO nasopharynx

SmartArc (1–arc) prostate

SmartArc (2–arcs) thyroid

Pinnacle³ Expert deployment

Server / Compute

Server, data storage, and compute power – all in a single unit

Workstations

Virtual Client Connections (VCC) (PC & Mac)*

Hospital LAN (10 Mbs connection supported)

Satellite site(s)

Virtual Client Connections (VCC) (PC & Mac)*

Virtual Client Connections (VCC) (PC & Mac)[2]

Hospital WAN

System specifications

	Expert server	Expert client
CPU	Xeon E3 1275, 4-core, 3.5 GHz	Xeon E3 1275, 4-core, 3.5 GHz
Memory	32 GB (8 x DDR3 4 GB 1333)	32 GB (8 x DDR3 4 GB 1333)
Storage space	3.5 TB available storage	NA
RAID	LSI 4 port, 6 GB SAS RAID 5 controller	NA
Monitor	Widescreen (16:10); 1680 x 1050 with 24 bit color; supports extended monitor	
Network ports	Two 100/1000 Mbps network ports	Two 100/1000 Mbps network ports
DVD drive	Included	Included
Data storage	Four 2 TB (raw) hard disk drives configured in a RAID 5 storage array with a single hot-spare hard drive yielding approximately 3.5 TB of usable storage for patient data, Pinnacle[3] binaries, and user home directories	
File systems	The Root (/) file system as well as /PrimaryPatientData (Patient Data), /export (Pinnacle[3] Binaries and Home Directories), and /files (DICOM Server) file systems will use the ZFS file system	
Performance	• Supports multiple thin client or VCC access point installations, up to three active connections at a time • System handles plans using up to a combined 30 GB of physical RAM • Supports up to eight system threads (example: two simultaneously calculating SmartArc plans using four threads each, or eight threads total)	
Dimensions	Width: 203.2 mm (8 in) Depth: 444.5 mm (17.5 in) Height: 425.45 mm (16.75 in) Weight: 14.74 kg (32.5 lb)	Width: 203.2 mm (8 in) Depth: 444.5 mm (17.5 in) Height: 425.45 mm (16.75 in) Weight: 13.8 kg (30.5 lb)
Power	500 W; 120–240 VAC 50/60 Hz with IEC input	500 W; 120–240 VAC 50/60 Hz with IEC input

Virtual Client Connection (VCC)

PC/Mac hardware	Not included (user provided)
Minimum specifications	• Windows*: minimum specifications as required by Microsoft Windows 7*, XP or Vista (32 and 64 bit) • Macintosh: OS X v10.6 (Snow Leopard) or later. 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 • Ethernet: 10/100/1000; 100 MB full duplex interface with switched network hub

Firewalls and ports

General	Pinnacle[3] Expert can function correctly in an environment with firewalls, provided that the necessary ports are opened between the systems.
ILOM management port requirements	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: • 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	The firewall must be open to allow devices to push images into the Pinnacle[3] system. The Pinnacle[3] DICOM listener will operate on the server cluster virtual IP address by default, using TCP port 104. The firewall must additionally be open to allow the Pinnacle[3] Expert Server and Clients 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.
Data sharing between Expert and thick clients	All ports pertaining to NIS/YP and NFS are required if firewalls exist between the Expert server and any attached clients. 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.
Printing	The firewall must allow the Pinnacle[3] Expert Server and Clients to initiate connections to all printers. The ports used for printing will depend on the protocol used to access the customer-owned printers.
Enterprise backup	The firewall must allow the Pinnacle[3] Expert Server and Clients to initiate connections 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 Pinnacle[3] Expert server, the firewall will need to be opened between the systems. 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	For faster problem resolution, a significant number of support calls can be resolved remotely via the Philips Remote Services Network (RSN). 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: • Pinnacle[3] Expert server: TCP port 22 • Pinnacle[3] Expert client: TCP port 22 • ILOM ports: TCP ports 443, 5121, 5555, 5556, 6481, 7578 • Workstation (thick-client): TCP port 22 (TCP 23, telnet, for older workstations that do not support SSH) (Sun Fire V250 and earlier)

Speed tests (H:MM:SS)[4]

Faster treatment planning for more efficient care

IMRT/DMPO	810	810X	Expert	Iterative Dose Engine	Final Dose Engine	Grid Resolution
7-beam nasopharynx	6:50	3:50	1:48	SVD	CCC	2mm
SmartArc	**810**	**810X**	**Expert**	**Iterative Dose Engine**	**Final Dose Engine**	**Grid Resolution**
1-arc prostrate	NA	45:00	20:27	SVD	CCC	2mm
1-arc nasopharynx	1:02:30	33:15	14:10	SVD	CCC	2mm
2-arc nasopharynx	2:06:36	1:04:40	26:33	SVD	CCC	2mm

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[3] is operating properly after backup agent installation.

Compatible backup agents:[5]

- EMC Legato Networker
- HP Data Protector
- IBM Tivoli Storage Manager
- Symantec[3] Veritas Backup Exec[6]
- Symantec Veritas NetBackup[6]
- Bakbone Netvault

1. See speed tests table above. Documentation on file.
2. Windows: minimum specifications as required by Microsoft Windows 7, XP or Vista (32 and 64 bit)
   Macintosh: OS X v10.6 (Snow Leopard) or later. English, French, German, and Dutch localized keyboards only
3. Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. Microsoft and Windows are either trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries. Symantec, NetBackup, Backup Exec, and Veritas are trademarks or registered trademarks of Symantec Corporation or its affiliates in the U.S. and other countries. Apple, Mac and Macintosh are trademarks of Apple, Inc. registered in the United States and other countries. Other brand or product names are trademarks or registered trademarks of their respective holders.
4. Optimization and dose computation times calculated in Pinnacle[3] 9.8 with 2mm dose grid resolution using Collapsed Cone Convolution Superposition for final dose computation
5. 100 MB of available disk space is required.
6. Symantec Veritas Backup Exec version 12.5 or higher required to support RALUS agent. Full restore to intermediate storage location may be required due to inability of some versions of Backup Exec to restore directly to Solaris ZFS file system.

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