The power of centralized computing in a compact package

Philips Pinnacle³ Expert

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 350%[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

PHILIPS

1. Pinnacle³ Expert highlights

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 350% versus the 810 and up to 200% versus the 810X.[1]

Improve user access

- Access all Pinnacle³ functionalities from a variety of devices, including Sun Ray thin clients, PCs, and Macs[2]
- 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 Mac computers as client access points
- Manage an entire Pinnacle³ network from one server

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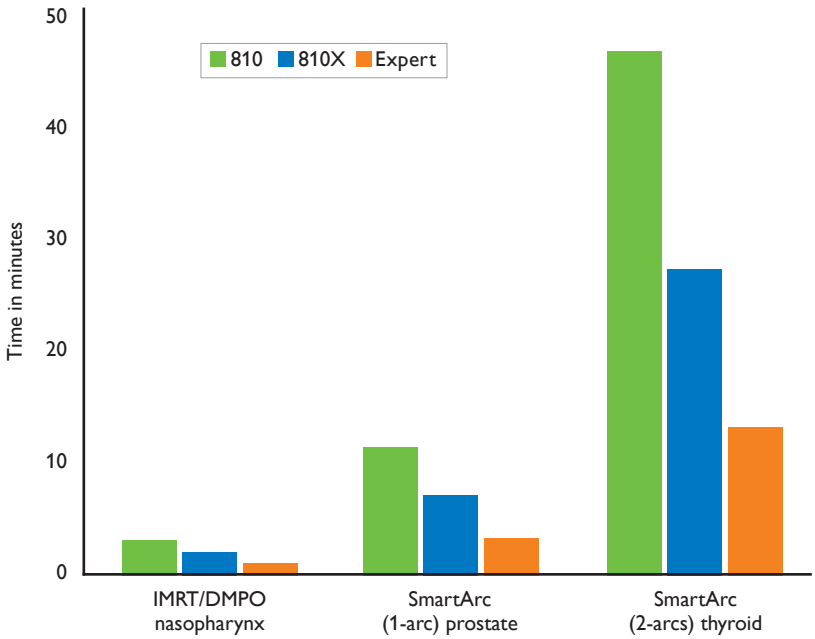
Pinnacle³ Expert performance comparison

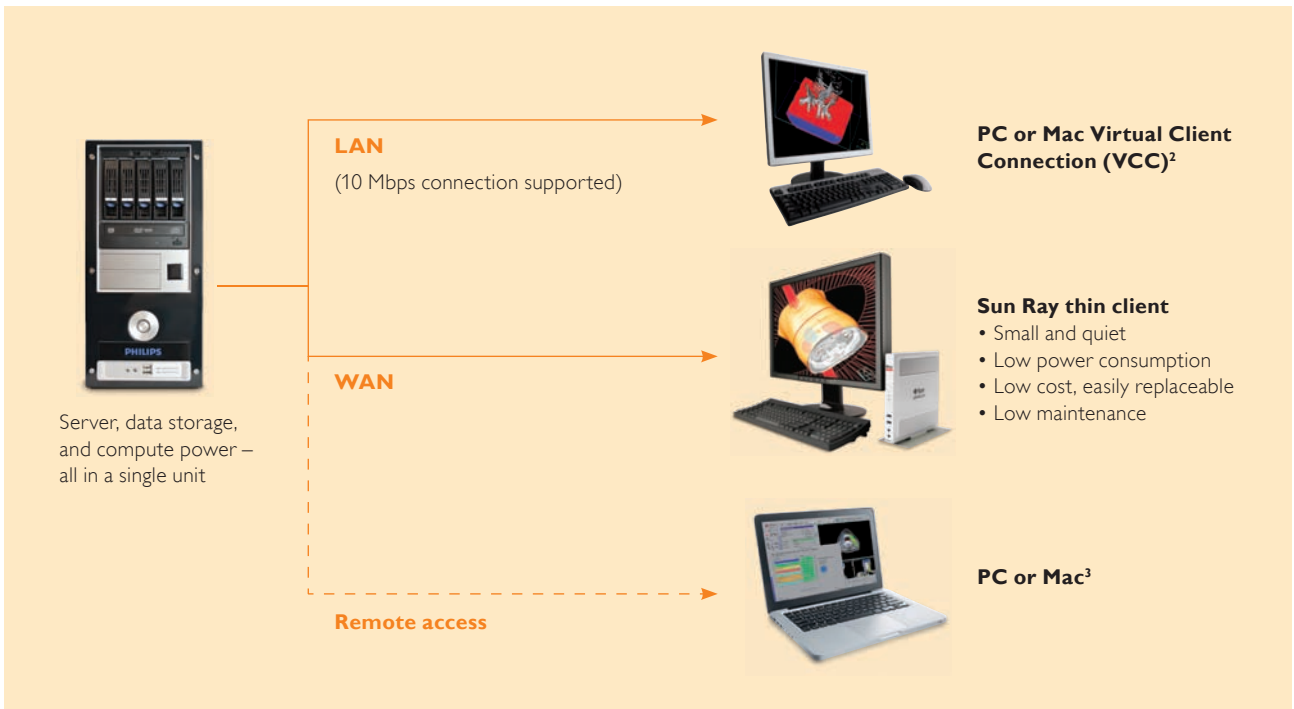


Pinnacle³ Expert is up to 350% faster than the 810 and up to 200% faster than 810X*

Optimization and dose computation times calculated in Pinnacle³ 9.6 with 4 mm dose grid resolution with Adaptive Convolve and SVD dose engines.

*See speed test results on page 7.

Typical Pinnacle³ Expert deployment



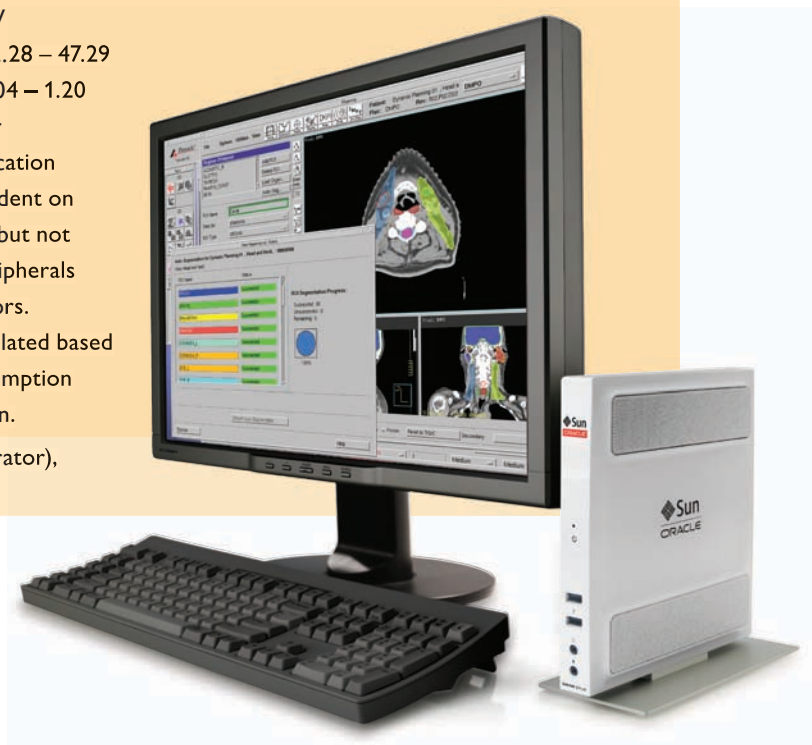
2. System specifications

Pinnacle³ Expert Server specifications (subject to change)		
	Expert server	**Expert client**
CPU	Xeon E3 1275, 4-core, 3.5 GHz	
Memory	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	
DVD drive	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, Pinnacle³ binaries, and user home directories	
The Root (/) file system as well as /PrimaryPatientData (Patient Data), /export (Pinnacle³ 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)	
Sun Ray desktop units		
Sun Ray 3 Plus client	• Four USB 2.0 ports • 1 x 10/100/1000 Ethernet port • 24" LCD display 1680 x 1050, dual monitor support for a total desktop area of 3360 x 1050	
Virtual Client Connection (VCC) – PC not included		
Minimum specifications	• Windows: minimum specifications as required by Microsoft Windows 7, XP or Vista (32 and 64 bit) • Macintosh: OS X version 10.6 or later • Disk space: 100 MB to load emulation application • Display resolution: 1280 x 1024 or better (dual monitors are supported) • Ethernet: 10/100/1000; 100 MB full duplex interface with switched network hub	

3. Sun Ray thin clients

Sun Ray thin clients provide the flexibility to access Pinnacle³ from virtually any location on a variety of devices to help facilitate faster plan completion for efficient patient care.

OEM model	Oracle Sun Ray 3+
Philips Sun Ray kit contents	One Sun Ray 3+ desktop unit (DTU), one 24" LCD display, one USB keyboard, one USB mouse
Ethernet port	1 x 1000 Mbps
Bandwidth	A minimum bandwidth of 10 MBit/sec to the Pinnacle³ application server must be available for basic performance
IP address	Static address or DHCP supported
Dimensions	Sun Ray 3+ DTU with/without stand: Width: 75.3 mm (2.95 in) / 28 mm (1.09 in) Depth: 180 mm (7.09 in) / 180 mm (7.09 in) Height: 221 mm (8.70 in) / 215 mm (8.46 in) Weight: 1 kg (2.2 lb) / 0.75 kg (1.64 lb)
DTU peripheral connectivity	Four USB 2.0 connectors (two front, two back), two DVI-I connectors, one serial port, one stereo audio microphone in, one audio headphone/line-out, one cable lock slot
DTU card reader	ISO-7816 smart card reader (use of smart cards is optional)
Ethernet port	10/100/1000 gigabit Ethernet (RJ-45)
Ergonomics	The Sun Ray 3+ DTU product has been tested and found to comply with all applicable GS ergonomic requirements
Energy consumption	Energy Star 5.0-qualified External 36 W worldwide auto-sensing power supply (100-240 VAC) Idle state: 13.75 – 14.15 W Off state: 0.31 – 0.35 W BTU/hour, Idle state: 42.28 – 47.29 BTU/hour, Off State: 1.04 – 1.20 Note: The actual power consumption at your location could vary and is dependent on many factors including, but not limited to, attached peripherals and environmental factors. Heat dissipation is calculated based on known energy consumption at one hour of operation.
Acoustic	< 3.5 B, < 28 dBA (operator), ISO 9296



4. Firewall and ports

General	The Pinnacle³ Expert system can function correctly in an environment with firewalls, provided that the necessary ports are opened between the systems. The network in the production systems provides connections between the Expert server and any connected thick clients. Connectivity in and out of these systems is described in later sections.
ILOM management port requirements	The management network connection requires the following ports to be open between the client (a web browser on the healthcare 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) For web-based interface to manage the Sun Ray server application on the Pinnacle³ application servers: • HTTP/HTTPS: TCP ports 1660 and 1661 (HTTP automatically redirects to HTTPS)
Sun Ray thin client and PC access point ports	The following ports are required between Sun Ray thin clients and Pinnacle³ application server: • Sun Ray server application: TCP and UDP ports 7009 • Sun Ray load-balancing: TCP and UDP ports 7011 • Sun Ray graphics: TCP and UDP ports 32768 – 65535 • 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 Pinnacle³ system. By default, the Pinnacle³ DICOM listener will operate on the server cluster virtual IP address, using TCP port 104. The firewall must be open to allow the Pinnacle³ system to push data into record and verify systems, other treatment planning systems, etc. The firewall must allow the Pinnacle³ application server and each Pinnacle³ workstation to initiate connections to all such devices. By default, the DICOM protocol operates on TCP port 104, 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.
Printing	The firewall must allow the Pinnacle³ application server and each Pinnacle³ workstation to initiate connections to all printers. Ports used for printing will depend on the protocol used to access the customer-owned printers.
Enterprise backup	The firewall must allow Pinnacle³ Expert server (and virtual IP address) to communicate with the customer's enterprise backup system. 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 Expert server, the firewall will need to be opened between the Expert server (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 thick client networked 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: • Pinnacle³ Expert server: TCP port 22 • Pinnacle³ application server(s): 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) • Sun Rays: Remote support connectivity to Sun Ray thin clients is not required

5. Backup

Philips recommends backing up data to the Pinnacle[3] Expert server by configuring the backup agent to utilize your existing enterprise backup system. To accomplish this, the customer must provide the appropriate backup agent to the Philips installation representative. Once the Philips installation representative has installed the backup agent on the Expert server, it is the responsibility of the customer to create schedules and to handle all operational responsibilities (e.g., monitoring backups and rotating tapes).

A Philips acceptance test verifies correct Pinnacle[3] operation after backup agent installation. Verified compatible backup agents:

- EMC Legato Networker
- HP Data Protector
- IBM Tivoli Storage Manager
- Symantec Veritas Backup Exec[4]
- Symantec Veritas NetBackup[4]
- BakBone NetVault

6. Speed tests

Faster treatment planning for more efficient care

	810	810X	Expert
Tonsil DMPO	01:44	01:10	00:45
Nasopharynx DMPO	03:09	02:08	01:10
1-arc prostate	11:33	07:08	03:29
2-arc prostate	22:34	13:37	06:55
1-arc nasopharynx	18:08	10:46	05:28
2-arc nasopharynx	34:45	20:44	10:21
1-arc thyroid	25:12	14:29	07:09
2-arc thyroid	46:17	27:02	13:07

Optimization and dose computation times calculated in Pinnacle[3] 9.6 with 4 mm dose grid resolution with Adaptive Convolve and SVD dose engines. Time (MM:SS).

Contact your Philips Healthcare representative for more information or visit www.philips.com/pinnacle-expert today.

[1] See speed tests table above. Documentation on file.
[2] Supports Macs with localized keyboards in English, French, German, and Dutch, OS X v.10.6 and higher.
[3] Supports Windows 7, Windows XP, and Windows Vista.
[4] 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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