

All Frequently Asked Questions  
HotPort Wireless Mesh Node  
HotView Mesh Management Software



Revision 1.2  
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# All FAQs: HotPort Wireless Mesh Node and HotView Mesh Management Software

Revision 1.2 February 28, 2005

If you would like to see additional questions answered in this document, please submit them by email to [support@firetide.com](mailto:support@firetide.com)

## **Customer Support**

[support@firetide.com](mailto:support@firetide.com)

408-399-7771

[www.firetide.com](http://www.firetide.com)

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## HotPort product family FAQ Index

<b>Platform</b> .....	5
1. How does the HotPort 3100/3200 family of products differ from the HotPoint? .....	5
2. What are the differences between the HotPort 3103 and 3203 mesh nodes? .....	5
3. Can HotPort outdoor and indoor mesh interoperate? .....	5
4. Do the HotPort support Power over Ethernet (PoE)? .....	5
5. How compatible or interoperable is a HotPort mesh node with other networking equipment? .....	5
6. What is the environmental operating range of the HotPort 3103 indoor mesh node? .....	6
7. What is the environmental operating range of the HotPort 3203 outdoor mesh node? .....	6
8. How many radios are in a HotPort mesh node? .....	6
9. *What radio spectrums do you support? .....	6
10. Are different antennas supported on a HotPort mesh node? .....	6
11. Can HotPorts and HotPoints be integrated in the same mesh network? ..	6
12. How does a Firetide HotPort network compare against multi-radio backbone mesh solutions? .....	6
13. What is the performance of a Firetide HotPort mesh network? .....	7
14. What types of on-board diagnostics are provided? .....	7
15. What are the advantages of a dual spectrum mesh node? .....	7
16. What are the power requirements of the HotPort wireless mesh node? ..	7
17. Is there support for solar or battery power as a primary or secondary source? .....	7
18. Is the HotPort 3103 plenum rated? .....	7
19. Can a Wi-Fi client device associate directly with a HotPort wireless mesh node? ..	7
20. Can a mesh of each type coexist next to each other? .....	7
21. What do the front panel LED lights indicate? .....	7
22. How many nodes can we support in a HotPort mesh network? .....	8
23. Are the ports on the HotPort auto sensing? .....	8
24. How can a HotPort mesh node be reset to factory defaults? .....	9
25. How can a HotPort mesh node be reset while retaining the current node configuration? .....	9
26. What types of devices can be connected to a HotPort mesh node? .....	9
<b>Security</b> .....	10
27. What types of encryption are supported on the HotPort mesh? .....	10
28. Is the HotPort mesh node FIPS compliant? .....	10
29. What type of administrative security are supported? .....	10
30. What is the maximum reach of both the HotPort 3103 indoor and HotPort 3203 outdoor mesh nodes? .....	10
31. What types of traffic filtering are supported on a Firetide HotPort mesh? .....	10
32. Does the HotPort mesh network support VLANs? .....	10

33.	How many VLANs can be supported simultaneously on a Firetide HotPort mesh?.....	10
34.	What is VLAN trunking, and how is VLAN trunking supported on the HotPort? .....	11
35.	Does the HotPort mesh support traffic prioritization? .....	11
36.	What is a Network Gateway Interconnect (NGI)? How does this compare with MIMO or 802.16d? .....	11
37.	Is Firetide using shorter WEP encryption keys than the industry standard? .....	11
38.	Does the mesh suffer performance degradation by enabling WEP encryption? What about for AES encryption? .....	11
39.	What happens to an encrypted packet as it traverses the mesh? .....	11
40.	What are the differences between tagged and untagged VLAN traffic and how is each processed on the mesh?.....	11
41.	What is a Gateway Group and what are the benefits?.....	12
42.	How many Gateway Groups can there be in a mesh?.....	12
43.	How many NGIs are supported in a Gateway Group? What about on an entire mesh?.....	13
44.	Can an NGI node be moved to another Gateway Group?.....	13
45.	Can additional devices be connected to a Gateway node? .....	13
	<b>Mesh Management</b> .....	14
46.	What is the level of management control over HotPort mesh nodes?.....	14
47.	Does HotView provide network and radio statistics?.....	14
48.	What are the baseline system requirements to run HotView? .....	14
49.	Can HotView manage a HotPoint mesh network? .....	15
50.	How many meshes can HotView manage?.....	15
51.	Can a custom background image or map be imported into the mesh view? .....	15
52.	Can an Ethernet port be individually configured?.....	15
53.	Can the power level of the radio be adjusted? .....	15
54.	What are the default settings for frequency, channel and output power?15	
55.	Can HotView be configured to remotely manage a HotPort mesh network?.....	15
56.	Can the radio statistics be used to perform site survey?.....	15
57.	How is link quality defined?.....	15
58.	Does HotView support event logging.....	16
59.	What is the default fault update interval? .....	16
60.	How can the mesh be enabled for remote management access?.....	16
61.	Are there any restrictions on the HotPort node where the HotView workstation is connected? .....	16

## Platform

### 1. **How does the HotPort 3100/3200 family of products differ from the HotPoint?**

The HotPort family of products was architected and engineered with performance (up to 25 Mbps) and scalability as design goals. New features supported include multiple network gateway interconnects, VLAN support, and traffic prioritization, all of which can be managed by the new HotView mesh management software. The HotPort family incorporates an extensible modular design allowing for future capabilities. As customer needs are identified, the extensible design allows additional capabilities to be easily added.

### 2. **What are the differences between the HotPort 3103 and 3203 mesh nodes?**

The HotPort 3103 indoor mesh node is designed for use in indoor, environmentally controlled (temperature, moisture) environments, away from the elements. A built-in 4-port Ethernet switch provides device connectivity. The HotPort 3203 outdoor mesh node is designed for outdoor environments, and it provides two switched Ethernet ports. The 3203 incorporates an IP67/NEMA 4X compliant watertight enclosure and connectors, ensuring complete protection from harsh weather conditions. Also, high gain outdoor antennas that meet international regulatory standards are available for both radio spectrums.

### 3. **Can HotPort outdoor and indoor mesh interoperate?**

HotPort 3100 and 3200 series mesh nodes are fully compatible with each other. This enables creation of a mesh network within buildings, then extended outdoors across a campus, community, municipality, or region.

### 4. **Do the HotPort support Power over Ethernet (PoE)?**

The HotPort 3203 outdoor mesh node accepts IEEE 802.3af compliant PoE, and power can be injected to both of the Ethernet ports. The HotPort 3203 is both power sourcing equipment (PSE) and a powered device (PD), but not simultaneously. Standard PoE voltage levels up to 48 VDC are supported. The HotPort 3103 indoor mesh node does not support PoE.

### 5. **How compatible or interoperable is a HotPort mesh node with other networking equipment?**

HotPort mesh nodes provide internetworking compatibility at Layer 2 (Ethernet). This enables the creation of a HotPort wireless mesh network that behaves as an Ethernet switch, which is fully compatible and interoperable with all Ethernet switching and routing protocols (including IPv6, VPN tunnels, VLANs, OSPF, BGP, RIP, Multicast, MPLS, etc.). This capability allows multiple wireless mesh networks, potentially from different vendors, to be inter-networked at Layer 2 or Layer 3 including both IPv4 and IPv6 protocols.

**6. What is the environmental operating range of the HotPort 3103 indoor mesh node?**

- Operating temperature: 0° C to +50° C
- Storage temperature: -20° C to + 70° C
- Humidity (non-condensing): 10% to 90%
- Storage humidity: 10% to 90%

**7. What is the environmental operating range of the HotPort 3203 outdoor mesh node?**

- Enclosure: conforms to the U.S. National Electrical Manufacturers Association (NEMA) 4X standard as well as the International Electrotechnical Commission (IEC) Ingress Protection (IP) standard 67
- Operating temperature: -40° C to +55° C
- Storage temperature: -40° C to + 80° C
- Humidity (non-condensing): 5% to 95%
- Storage humidity: 5% to 95%

**8. How many radios are in a HotPort mesh node?**

The HotPort mesh node creates a mesh infrastructure using a single radio that is dedicated to mesh backbone traffic. Wireless client access is accommodated by attaching one or more Wi-Fi access points whose function is dedicated to client access. Thus for a Wi-Fi access application, the HotPort is a two radio solution.

**9. \*What radio spectrums do you support?**

HotPort mesh nodes operate in the 2.4 GHz (2.400 to 2.497 GHz) and 5 GHz (5.150 to 5.250 GHz; 5.250 GHz to 5.350 GHz; 5.750 to 5.825 GHz) spectrums.

**10. Are different antennas supported on a HotPort mesh node?**

A pair of dual spectrum (5 GHz and 2.4 GHz) omni-directional antennas rated at 6 dBi are provided with the HotPort 3103 and the 3203 wireless mesh nodes. The HotPort 3203 also supports optional spectrum-specific, high gain 8 dBi omni-directional antennas for either 2.4 GHz or 5 GHz.

**11. Can HotPorts and HotPoints be integrated in the same mesh network?**

Because of the significant performance capability in the HotPort architecture, HotPoint nodes cannot operate on a HotPort mesh network. However, HotPort- and HotPoint-specific mesh networks can be bridged together via Ethernet.

**12. How does a Firetide HotPort network compare against multi-radio backbone mesh solutions?**

HotPort mesh networks provide the best price/performance among all mesh solutions on the market. The HotPort family offers up to 25 Mbps of performance at a significantly lower price per Megabit of throughput. This is in addition to the scalability and class-leading ease of use for deployment.

**13. What is the performance of a Firetide HotPort mesh network?**

Up to 25 Mbps of throughput has been consistently observed in Firetide testing.

**14. What types of on-board diagnostics are provided?**

Mesh node operating statistics are collected for diagnostic purposes on a per-port basis. These include input and output packets, input and output bytes, and collisions. All diagnostic information can be viewed with the HotView mesh management software.

**15. What are the advantages of a dual spectrum mesh node?**

HotPort products provide network designers with a full choice of RF spectrum including 2.4 GHz (OFDM/DSSS) or 5 GHz OFDM. Both spectrums provide high capacity capability up to 54 Mbps in half duplex operation. 5 GHz spectrum provides the advantage of higher capacity and minimal interference, while the 2.4 GHz spectrum brings generally greater range and better object penetration capabilities.

**16. What are the power requirements of the HotPort wireless mesh node?**

HotPort mesh nodes are powered via an external AC-to-DC transformer. The power supply is rated to accept voltage ranging from 90 to 240 VAC. Different power cables are available with plug configurations specific to all approved regions.

**17. Is there support for solar or battery power as a primary or secondary source?**

The HotPort 3203 outdoor mesh node can accept any DC power source, including via a photovoltaic (PV) solar panel array or battery power system rated at the appropriate power output. The DC power input requires use of the appropriate weather-tight connector.

**18. Is the HotPort 3103 plenum rated?**

Yes. The HotPort 3103 indoor mesh node is plenum rated and conforms to the UL 2043 specification.

**19. Can a Wi-Fi client device associate directly with a HotPort wireless mesh node?**

No. HotPort mesh nodes operate only in an Ad Hoc mode configuration. So the mesh network is dedicated to backbone use, and no Infrastructure mode client access is possible. Direct connections to the mesh are only possible via an Ethernet port on the HotPort mesh node.

**20. Can a mesh of each type coexist next to each other?**

Absolutely. Mesh networks can be logically configured to coexist next to each other. However, physically any wireless network is subject to co-channel interference.

**21. What do the front panel LED lights indicate?**

The HotPort 3103 wireless mesh node has 4 LED indicators: Power, Status, Fault and Mesh. There are also LED indicators for each of the 4 Ethernet ports. HotPort 3203 has 3 status LED indicators: Power, Status and Fault.

<b>Indicator</b>	<b>Startup Indicator Functions</b>	<b>Post-Startup Indicator Functions</b>
<b>Power</b>	During startup, this indicator remains continuously on.	After startup, this indicator remains continuously on to indicate that HotPort node is receiving power.
<b>Status</b>	During startup, this indicator will remain continuously on to indicate a normal boot process.	After startup, this indicator will indicate the RF connection as follows:  Slow flash = 2.4 GHz DSSS Fast flash = 2.4 GHz OFDM Continuously on = 5 GHz OFDM LED off = node disabled.
<b>Fault</b>	During startup, this indicator will illuminate as a YELLOW light.	After start up, this indicator color will change to GREEN to indicate normal conditions.  If the indicator remains YELLOW or changes to YELLOW, this indicates a fault condition.
<b>Mesh</b>	During startup, this indicator will turn on.	After startup, this indicator will illuminate only when the HotPort node meshes with other HotPort nodes.  If this indicator is off, the node is not connected to any other nodes.
<b>Ethernet port Indicators (1-4)</b>	During startup, these four indicators will turn on.	These four indicators are numbered to correspond to the four rear panel ports. They will indicate the port status as follows:  Continuously on = link but no activity Flashing = link and activity Indicator Off = no link established

**22. How many nodes can we support in a HotPort mesh network?**

The mesh network can normally be scaled to 50+ nodes.

**23. Are the ports on the HotPort auto sensing?**

Yes. Ethernet ports on HotPort mesh nodes are auto sensing. These auto-MDI/MDIX ports automatically negotiate (auto sense) the proper transmit and receive connections and set the connections electronically, thereby eliminating the need for specifically-wired cables.

**24. How can a HotPort mesh node be reset to factory defaults?**

The HotPort 3103 indoor mesh node is reset by inserting a rigid, small diameter pin to depress the reset button. Resetting the HotPort 3203 outdoor mesh node require both Ethernet ports to be connected to each other while the unit is powered on. First, ensure your HotPort 3203 is powered off. Then attach Ethernet transition cables to each Ethernet port. Next, bridge the transition cables together with any Ethernet cable. Finally, apply power to the HotPort 3200 for 2 minutes. This action will restore the unit to original factory settings where it can be reconfigured via the HotView management software.

**25. How can a HotPort mesh node be reset while retaining the current node configuration?**

Either a HotPort 3103 indoor mesh node or HotPort 3203 outdoor mesh node can be reset while retaining their configuration via the HotView mesh management software. Alternatively, individual nodes can be reset by removing and reapplying power to the unit.

**26. What types of devices can be connected to a HotPort mesh node?**

Firetide HotPort mesh networks operate at Layer 2, so any network-connected device that uses an Ethernet interface can be connected to a HotPort mesh node. Ethernet devices include a Wi-Fi access points, IP video cameras, printers, computers, servers, switches, hubs, routers, or any other network-connected device.

## Security

### **27. What types of encryption are supported on the HotPort mesh?**

Wireless Equivalent Privacy (WEP) and Advanced Encryption Standard (AES) encryption are supported on all data and management traffic. WEP is supported by 40-bit and 104-bit key lengths (sometimes referred to as 64-bit and 128-bit key lengths when the three bytes reserved by the protocol are included). AES is supported by 128-bit and 256-bit length encryption keys.

### **28. Is the HotPort mesh node FIPS compliant?**

HotPort is FIPS 140-1 compliant and requires an access point network to meet 140-2 compliance.

### **29. What type of administrative security is supported?**

HotView offers two levels of access: User and Supervisor monitoring. User-level access allows monitoring of information but prohibits making any changes to the mesh. Supervisor-level access grants full rights to adjust settings for any node or the entire mesh.

### **30. What is the maximum reach of both the HotPort 3103 indoor and HotPort 3203 outdoor mesh nodes?**

Both models come with omni directional antennas. The expected reach of the HotPort 3103 is up to 300m at 5 GHz. The expected reach of the HotPort 3203 equipped with the optional 8 dBi high gain antenna is up to 600m. So a HotPort 3103 must be placed within 300m (open environment) of a HotPort 3203 in order to execute link-up.

### **31. What types of traffic filtering are supported on a Firetide HotPort mesh?**

Both white list ("Allow") and black list ("Deny") MAC address filtering is supported on the mesh. A white list filter grants permission to all devices allowed to access the mesh. A black list filter describes addresses specifically prohibited from accessing the mesh.

### **32. Does the HotPort mesh network support VLANs?**

Full VLAN capability is supported on a Firetide HotPort mesh network. Both internal and external VLANs are supported. Internal VLANs allow individual ports on any HotPort node to be designated as belonging to a specific VLAN. The second type supports VLANs existing externally to the mesh. All VLAN-tagged packets conform to the IEEE 802.1q standard and processed according to the VLAN configuration of the mesh.

### **33. How many VLANs can be supported simultaneously on a Firetide HotPort mesh?**

Up to 16 port-based VLANs can be supported simultaneously on a HotPort mesh network. Up to 4096 VLAN IDs are also supported. One VLAN per port can be supported except when that port is configured as a VLAN trunk port.

**34. What is VLAN trunking, and how is VLAN trunking supported on the HotPort?**

Also known as VLAN trunking protocol (VTP), it is a logical connection of ports across more than one switch. If membership is validated the trunk can transport the data traffic of multiple VLANs. VLAN trunking is only supported on Ethernet ports 3 and 4 of a HotPort 3103 (ports 1 and 2 are disabled when VLAN trunking is enabled). Both ports on a HotPort 3203 support VLAN trunking.

**35. Does the HotPort mesh support traffic prioritization?**

Yes. Also known as Class of Service (CoS), HotPort supports three levels of traffic priority: high, medium, and low, with traffic classification performed at ingress port. Firetide's implementation of CoS is end-to-end. The default setting is the lowest priority. Traffic prioritization is support on all ports.

**36. What is a Network Gateway Interconnect (NGI)? How does this compare with MIMO or 802.16d?**

An NGI is a portal providing access into or out of the mesh while internetworking with other network domains. An NGI normally provides a connection to another wired LAN or the Internet itself. Optimizing traffic flow across the mesh is another attribute of using multiple NGIs to provide additional and/or redundant paths for network services. NGIs can be aggregated into clusters called Gateway Groups.

**37. Is Firetide using shorter WEP encryption keys than the industry standard?**

No. All Firetide equipment implements radios that use industry standard WEP encryption. The Wireless Equivalent Privacy (WEP) standard specifies 40-bit and 104-bit length keys. Each key employs a 3-byte (24-bit) header that is always the same, making the key lengths 64 bits or 128 bits.

**38. Does the mesh suffer performance degradation by enabling WEP encryption? What about for AES encryption?**

No performance degradation occurs with either WEP or AES encryption enabled.

**39. What happens to an encrypted packet as it traverses the mesh?**

With WEP encryption enabled, each data packet is encrypted at each hop. AES encryption is performed on data packets at the ingress point to the mesh and remains encrypted until it reaches the egress point of the mesh.

**40. What are the differences between tagged and untagged VLAN traffic and how is each processed on the mesh?**

The following table describes how a tagged or untagged packet is processed at an ingress port to the mesh.

Incoming Packet	Entry Port	Exit Port	Result
Tagged	Tagged	Tagged or Untagged	If the VLAN ID of packet is the same as the entry port's VLAN ID, the packet goes through. If the VLAN ID of the packet does not match the entry port's VLAN ID, the packet is dropped at the entry port.
Tagged	Tagged	Tagged	If the VLAN ID of the packet matches the VLAN ID of the exit port, the packet goes out as tagged. If the VLAN IDs do not match, the packet is dropped at the exit port.
Tagged	Tagged	Untagged	If, and only if, the packet's VLAN ID matches the VLAN ID set on the exit port, does the packet go out as an untagged packet.
Tagged	Untagged	Tagged or Untagged	If the VLAN ID of the entry port matches the VLAN ID of the incoming packet, the packet goes through. If the VLAN IDs do not match, the packet is dropped.
Untagged	Untagged	Untagged	All packets are sent out on the exit port as untagged packets.
Untagged	Tagged	Tagged	If the VLAN ID configured on the entry port does not match the VLAN ID configured on the exit port, the packet is dropped on the exit port.
Untagged	Tagged	Untagged	If the VLAN ID configured on the exit port matches the VLAN ID of the entry port, the packet goes through as an untagged packet. If the VLAN ID on the exit port does not match the VLAN ID on the entry port, the packet is dropped at the exit port.

**41. What is a Gateway Group and what are the benefits?**

A Gateway Group is a selection of NGIs clustered into a single subnet to further increase efficiency of each interconnection. This clustering brings a bandwidth boost effect, providing multiple concurrent paths for traffic to traverse.

**42. How many Gateway Groups can there be in a mesh?**

Up to eight Gateway Groups can be supported on each mesh network.

**43. How many NGIs are supported in a Gateway Group? What about on an entire mesh?**

16 NGIs can be supported within a mesh entity called a Gateway Group, while up to 128 NGIs can be supported on each mesh network.

**44. Can an NGI node be moved to another Gateway Group?**

A node serving as an NGI can be assigned to another Gateway Group. First the NGI must be deleted from the existing Gateway Group, and then recreated in the desired Gateway Group.

**45. Can additional devices be connected to a Gateway node?**

No. A node serving as a Network Gateway Interconnect becomes dedicated to that function and all other Ethernet ports are disabled.

## Mesh Management

### **46. What is the level of management control over HotPort mesh nodes?**

HotView provides the ability to manage each individual node or the entire mesh network in its entirety. Management control is provided down to the port level on individual nodes.

### **47. Does HotView provide network and radio statistics?**

Yes. The following mesh statistics are provided via HotView mesh management software.

Node neighbor statistics – shows the node name as well as the number of packets transmitted and received.

Ethernet port-specific statistics include:

- Port Number
- Input Packets
- Output Packets
- Input Bytes
- Output Bytes
- Packet Collisions
- Receive Errors

Radio statistics include:

- Link Quality
- RSSI (receive signal strength indicator, in dBm)
- Noise (in dBm)
- Input Packets
- Output Packets
- Input Bytes
- Output Bytes
- Transmit Errors
- Receive Errors
- Retransmitted Packets
- Retransmitted Failed Packets
- Dropped Packets

### **48. What are the baseline system requirements to run HotView?**

- Processor: 1.3 GHz Pentium III class or higher
- Memory: 256MB
- Disk space: 50 MB free
- Operating Systems: Windows 2000, Window XP/Pro, Linux 2.0 kernel or later
- Java run-time environment (JRE): 1.5 or higher for HotView UI
- Internet Explorer 6.0 or FireFox 1.0 for downloading updates

**49. Can HotView manage a HotPoint mesh network?**

No. Please use HotPoint Manager to manage a HotPoint mesh network.

**50. How many meshes can HotView manage?**

Only one mesh network can be managed at a time. Each HotPort mesh network requires its own HotView mesh management session. Multiple HotView sessions can, of course, be launched on a single workstation.

**51. Can a custom background image or map be imported into the mesh view?**

Yes. Users can import graphics such as floor plans or maps that are conducive to their physical environment to depict the physical locations of all HotPort nodes.

**52. Can an Ethernet port be individually configured?**

Ethernet ports can be set specifically to either 10 Base-T or 100 Base-T. Auto-negotiation can also be enabled or disabled for each individual port.

**53. Can the power level of the radio be adjusted?**

Yes. Transmit power control of the radio is supported in 25% increments.

**54. What are the default settings for frequency, channel and output power?**

- AES encryption: Disabled
- WEP encryption: Disabled
- Mesh IP address: 192.168.224.150
- Ethernet ports: All ports enabled
- HotView username: admin
- HotView password: firetide
- 802.11 operation: 5.3 GHz OFDM, radio channel = 60, Power = 17 dBm, SSID = HOTPORT\_MESH

**55. Can HotView be configured to remotely manage a HotPort mesh network?**

Yes. The HotView user manual provides situation-specific instructions on how to configure a Network Gateway Interconnect to permit remote access and management.

**56. Can the radio statistics be used to perform site survey?**

Radio statistics similar to those provided with a Wi-Fi access point are provided. Specifically, those metrics measure link quality, including signal strength and noise, which can help the network installer optimize the placement of HotPort mesh nodes.

**57. How is link quality defined?**

Link quality is a ratio based upon RSSI and noise levels. The value for the receive signal strength indicator (RSSI) should be higher relative to the value for noise. Ideally RSSI should be at least 10dB higher than the noise level.

**58. Does HotView support event logging**

Yes. A fault log of events logs up to 1000 fault events. The last ten fault log files are retained for auditing purposes.

**59. What is the default fault update interval?**

The default rate is 300 seconds. Update granularity can be adjusted from 0 to 9999 seconds.

**60. How can the mesh be enabled for remote management access?**

See the Firetide technical note *Configuring a Firetide HotPort mesh network* for remote management access.

**61. Are there any restrictions on the HotPort node where the HotView workstation is connected?**

The only restrictions to the HotPort mesh node connecting the HotView management workstation are those related to VLAN trunking or if the node is configured as a Network Gateway Interconnect. This HotPort node, also called a head node, is bound by VLAN trunking rules and restricted only to ports 3 and 4 on a HotPort 3100. An NGI node can also be a head node with workstation access provided via a switch.

# # #