XO MESH NETWORKING TEST CASES

Test Equipment Needed

100 XO laptops
100 USB-to-Ethernet adapters (for Ethernet connectivity on XO)
1 school server
Ethernet switches
1 PC as a control host, runnig remote login software (e.g., SSH)
Protocol analyzer (e.g., OmniPeek, Wireshark)
Configuration scripts to run Mesh Portal Point functionality, and initiate mesh portal point discovery on an XO

Scope of Testing

Reliability of mesh point portal (MPP) discovery in a 100-laptop network,

- in different mesh network topologies
- when multiple MPP are present

Reliability of data transfer uplink/downlink to/from a mesh point portal, in a 100-laptop network

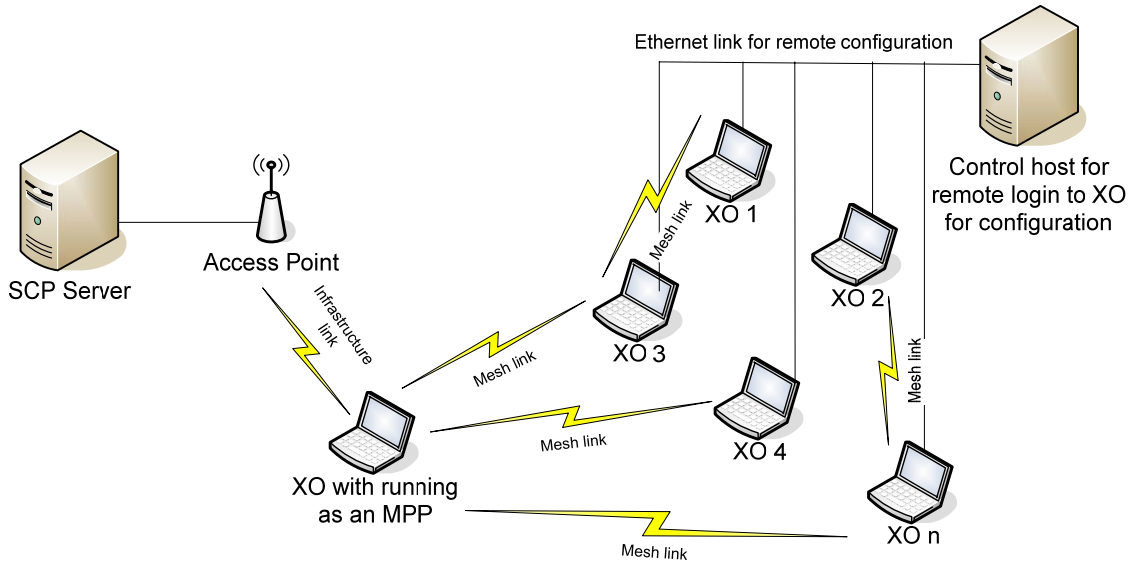

Figure 1

Test Description	Expected Results
1.1 Repeated Mesh Portal Point Discovery, Varying Network Topology	
Refer to figure 1. (a) In a 100-laptop mesh network, configure a node as an mesh portal point (MPP). (b) On the MPP, ping the other 99 laptops to check its connectivity with all the nodes. (c) Initiate MPP discovery on all 99 laptops. (d) Clear the forwarding table, ARP table and route table. (e) Repeat steps (c) to (d) 10,000 times. (f) Vary the topology of the mesh network so each laptop reaches the MPP through different intermediate nodes. (g) Repeat (c) to (f).	Ensure that an MPP is discovered on each node every time an MPP discovery is initiated.
1.2 Repeated Mesh Portal Point Discovery, Multiple Mesh Portal Points	
(a) Configure multiple MPP in the same mesh network as in 1.1. (b) Repeat the steps in 1.1. (c) Repeat the test with different number of MPP.	Ensure that an MPP is discovered on each node every time an MPP discovery is initiated.
1.3 100-Laptop File Transfer, Uplink	
(a) Using the same 100-laptop mesh network in 1.1, associate the MPP with an AP. (b) Connect an SCP server on the WAN side of the AP. (c) On each laptop, use SCP to transfer a 300 MB file from the SCP server. (d) Clear the forwarding table and ARP table on all laptops. (e) Repeat steps (c) to (d) for 10,000 times. (f) Vary the topology of the mesh network so each laptop reaches the MPP through different intermediate nodes. (g) Repeat (c) to (e).	All file transfer should succeed.
1.4 100-Laptop File Transfer, Downlink	
(a) Repeat the test in 1,3, by uploading a 300 MB file from each laptop to the SCP server.	All file transfer should succeed.
1.5 100-Laptop File Download Using A School Server	
(Taken from OLPC 100-laptop test plan on http://wiki.laptop.org/go/100_Laptop_TestPlan) *Refer to figure 2.* (a) Set up a school server as an MPP, and 100 laptops in a mesh network. (b) Start file download from the school server on all laptops at the same time. (c) Vary the mesh network topology. (d) Repeat (b) to (c).	All file download should succeed. Note file transfer speed on all laptops.

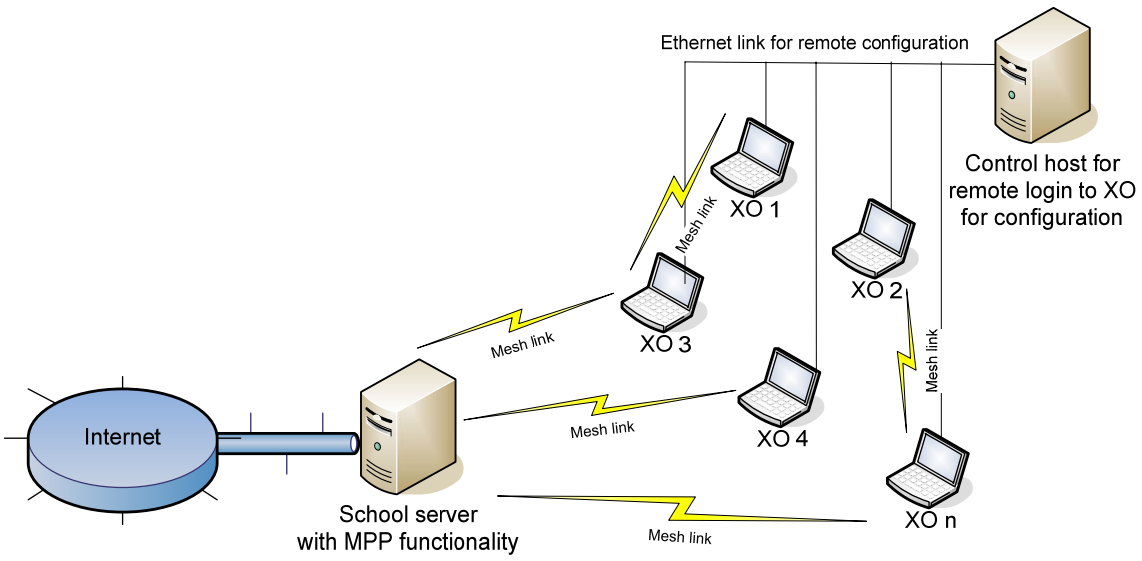
Ethernet link for remote configuration
Control host for remote login to XO for configuration
XO 1
XO 2
XO 3
XO 4
XO n
Mesh link
Mesh link
Mesh link
Mesh link
Mesh link
Internet
School server with MPP functionality

Figure 2