

Foundation Assumptions and Expectations:

OHN NOC's Network Monitoring System (NMS) will monitor Leaf Nodes and Responders as well as the health (QoS and Reachability) of their Network Gateways. Monitoring for network equipment on the Customer's LAN such as a non-associated switch for instance is not within the scope of the NMS System.

- The NOC will monitor QoS performance on service-provider links via leaf-nodes at the clients and responders at NWAX and other exchanges.
- Leaf-nodes and responders must be IP-reachable via the NMS.
- Leaf-nodes and responders must be IP-reachable across the link being monitored.
- Ad-hoc/transient monitoring requires leaf-nodes be reachable via IP to each other across the link in question.
- Leaf-nodes are, by design, inexpensive and low-powered devices. IP connectivity and routing are expected to be via static, connected, and/or default routes.
- QoS measurements will be initiated by the leaf-nodes and the NMS will poll the leaf-nodes for performance information.
- Leaf-nodes will generate pseudo-traffic on UDP and/or TCP ports to simulate application traffic.

Additional traffic analysis and troubleshooting will utilize sniffer/troubleshooting devices at the exchanges. The exchange will provide traffic data for analysis via a mirror port or similar technique.

FAQ

What are the components of the OHN NOC monitoring network?

- Leaf Node (traffic generator and monitoring point)
- Leaf Node Responder (traffic reflector)
- Troubleshooting Device (general purpose server, sniffer)
- NMS (Network Monitoring System)

How does the OHN NOC monitoring system measure SLA performance?

Leaf nodes generate artificial traffic directed at leaf node responders. The responders add telemetry data and return it to the leaf node. The traffic is generated and returned using Cisco's "IP SLA" feature.

What is measured by the monitoring system?

- Round-trip-time (RTT) between leaf nodes and responders
- One-way latency between leaf nodes and responders
- UDP jitter between leaf nodes and responders

- Measured data will be used to ensure SLA specifications are met by service providers and exchanges.

What are the physical and electrical requirements for OHN NOC monitoring equipment?

- Leaf nodes are deployed at participant sites and will require public IP addresses, which are provided by the participant's service provider. **NOTE: It is recommended that the Service Provider, route the participant a minimum of a /29 (6 usable IP Addresses) when they install the circuit so that the Leaf Node is guaranteed a usable IP Address.**
- The Leaf Nodes are Cisco 1721 routers and are 12"x4"x9" (WxHxD). They are desk/shelf/wall mountable and have a separate power supply with dimensions of 7"x3"x2". Nameplate power requirements are 120VAC at 1.0A with NEMA 5 plugs.
- Responders are deployed at exchanges. They are Cisco 2801 routers and are 18"x2"x17". They are 2-post and 4-post rack mountable and have an internal power supply. Nameplate power requirements are 120VAC at 5.0A with NEMA 5-15 plugs.
- Troubleshooting devices are Compaq DL320 servers and are 19"x2"x28". They are 2-post and 4-post rack mountable and have an internal power supply. Nameplate power requirements are 120VAC at 5A with NEMA 5-15 plugs. They will require two IP addresses, one for direct access and one for "console" ILO management access.
- Leaf nodes and responders will be deployed in pairs; an active device and a cold-spare. Additional capacity should be reserved for responders if capacity requirements increase.
- One troubleshooting device will be deployed at each exchange with the potential for additional devices if capacity requirements increase.
- All monitoring equipment at each site should be located in immediate proximity to each other.

What are the network requirements for the OHN NOC monitoring equipment?

- Bandwidth requirements for each leaf node are 375KB over 5 minutes (10Kbs).
- Bandwidth requirements for each responder are 375KB over 5 minutes (10Kbs) multiplied by the number of leaf nodes that are generating traffic to the responder.
- Troubleshooting devices will not generally regularly use network bandwidth. They will use bandwidth on an as-needed basis for troubleshooting purposes.
- Leaf nodes are connected via 100Mbps Ethernet over Category 5 cable. They require unfettered IP connectivity to the NMS, responders, other leaf nodes and the troubleshooting devices. Category 5 cable and access port (Ethernet Port) is to be supplied by the Service Provider or Participant Network Administrator for OHN NOC Leaf Nodes to be plugged into. Leaf nodes should be connected at the Service-Provider network entrance, if possible. They may also be connected behind the client CPE, but this will affect the SLA measurements and troubleshooting.
- Responders are connected via 100Mbps Ethernet over Category 5 cable. They require unfettered IP connectivity to the NMS, leaf nodes, other responders and troubleshooting devices.

- Troubleshooting devices are connected via 100Mbps Ethernet over Category 5 cable. They require unfettered IP connectivity to the NMS, leaf nodes, responders, and other troubleshooting devices.
- Troubleshooting devices will need to have Service Provider managed access to “sniff” traffic. This may be accomplished via a SPAN, Mirror, or similar Ethernet switch port and can be provided as part of the normal network connectivity. A second Ethernet port is available on the troubleshooting device for connection to a dedicated monitoring port if needed. The NOC will coordinate with the Service Provider if use of the monitoring port is needed.

Who will purchase the Leaf Node Responders and Leaf Nodes?

- OHN NOC through EasyStreet

Who will purchase the Network Troubleshooting Devices?

- The OHN NOC through EasyStreet

What level of operational involvement is required of Service Providers and IXPs?

- Network equipment will be configured by the OHN NOC and shipped to the Service Providers and IXPs for physical deployment. Service Providers should work with the participant to fill out the OHN NOC Site Start-Up Form and will need to provide public IP addresses for the monitoring equipment. Service Providers will physically install the Leaf Nodes at participant sites per OHN NOC instructions. IXPs will physically install the Leaf Node Responders and Network Troubleshooting Devices per OHN NOC instructions. Service Providers and IXPs will be required to work with the OHN NOC to ensure the installation of network equipment is IP reachable. Service Providers and IXPs will also need to work with the NOC to troubleshoot and resolve problems.