



OREGON HEALTH NETWORK

Orientation 5: Network Operations Center & OHN Portal System

Agenda

1. ***OHN's Network Operations Center (NOC) powered by EasyStreet Online Services***
2. ***Network Monitoring System (NMS)***
 - NOC architecture
 - Troubleshooting
 - Network monitoring scenario
 - Your connection's availability
 - Investigating, identifying and issuing alerts
 - NOC reports
3. ***OHN's Web-based MS Sharepoint Participant Site Portal System***
 - Portal overview and capabilities
4. ***Using the OHN Connection – Why, What, and How***
5. ***Next Steps & Resources***
 - Use the network
 - Resources and OHN staff contact information

***OHN's Network Operations Center (NOC)
powered by EasyStreet Online Services***

Who is “OHN NOC”?

The OHN Network Operations Center (NOC) is the core service that's offered by OHN. It monitors the network to ensure that each telecommunications vendor meets the contractually committed quality of service on its portion of the network.

OHN participants may contact the NOC for help whenever they have technical network problems. NOC staff will work with the telecom vendors to identify and resolve any problems.

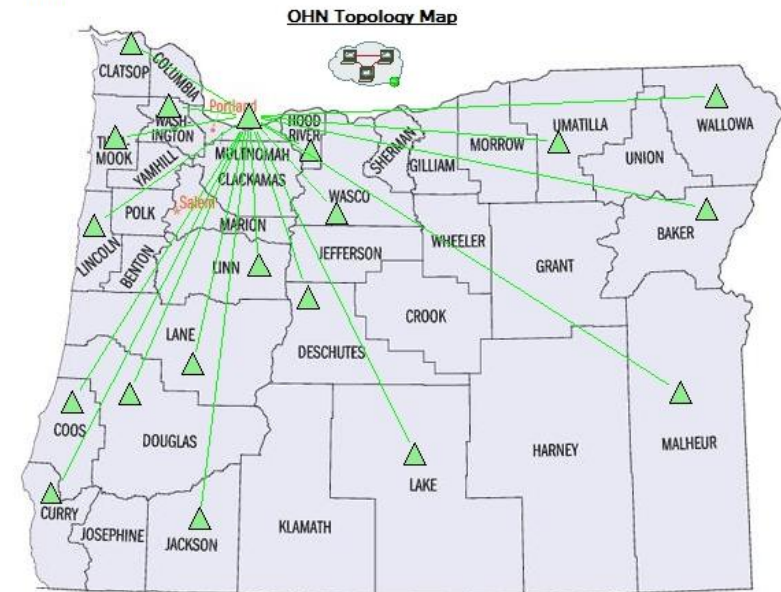
NOC contact information:

ohnnoc@easystreet.com

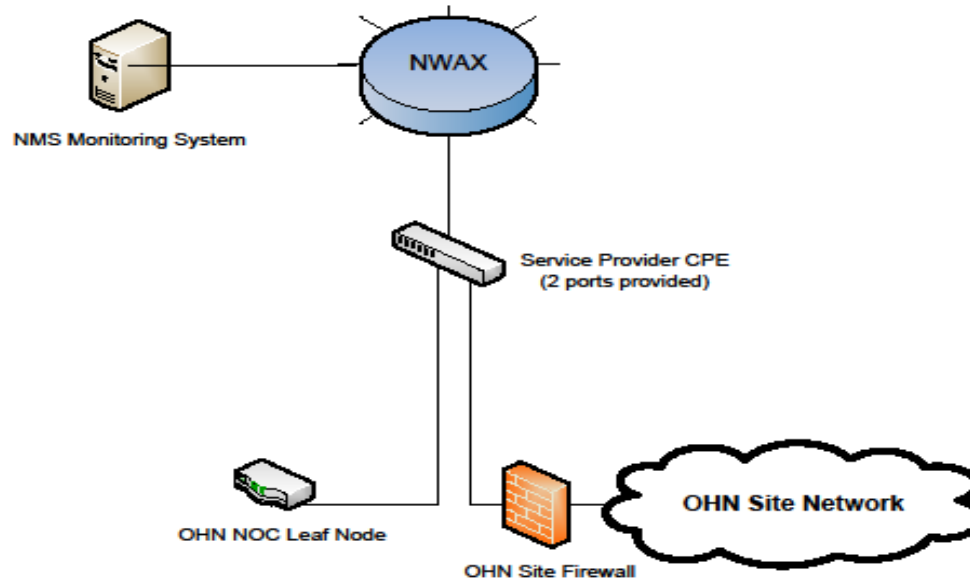
503-213-5400 or 1-877-260-1881



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OHN NOC Architecture



OHN NOC Reports, Metrics, Acronyms and Definitions

OHN NOC Network Monitoring System (NMS): Summary of Report Types

Network activity monitored in real-time

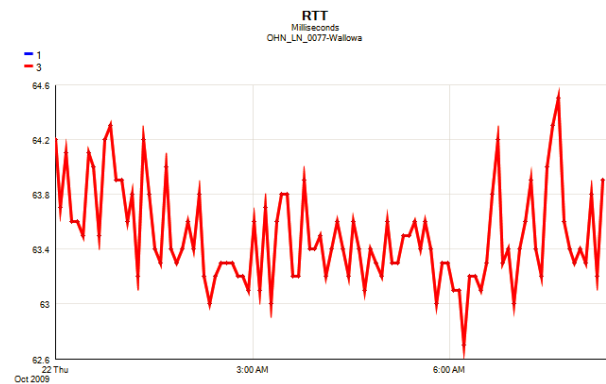
Average Response Time & Packet Loss



CPU Load & Memory Utilization

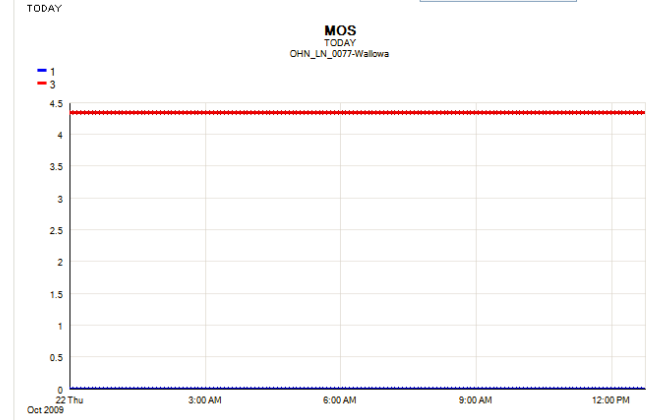


RTT



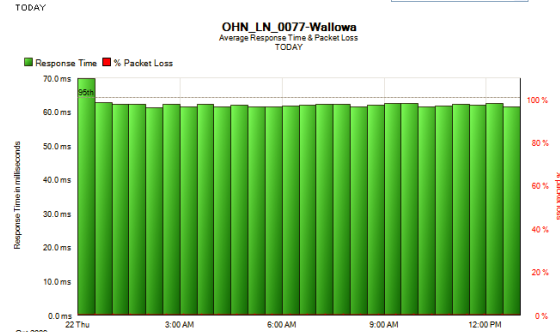
SolarWinds Orion Network Performance Monitor 9.5 SP4

MOS



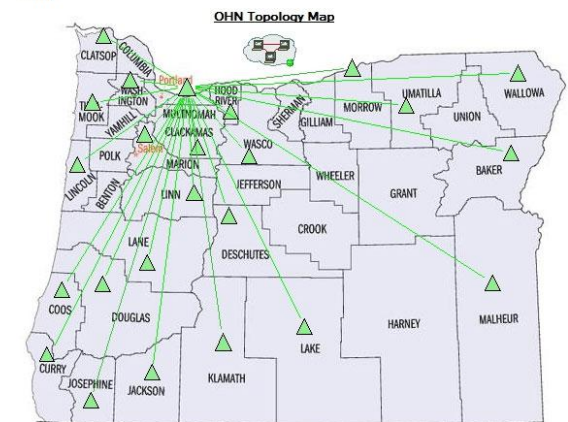
SolarWinds Orion Network Performance Monitor 9.5 SP4

Network Latency and Packet Loss - Today



Oct 2009
95th Percentile: Response Time is 64.0 ms
SolarWinds Orion Network Performance Monitor 9.5 SP4

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NOC Reports: Detail

Overview

- You will begin to receive these after the 1st month via your portal with an email notification.
- Summarizes all metrics mandated by your vendor's Service Level Agreement (SLA)
- Detail view of this summary is reflected in the next set of slides

SITE PERFORMANCE - MONTHLY

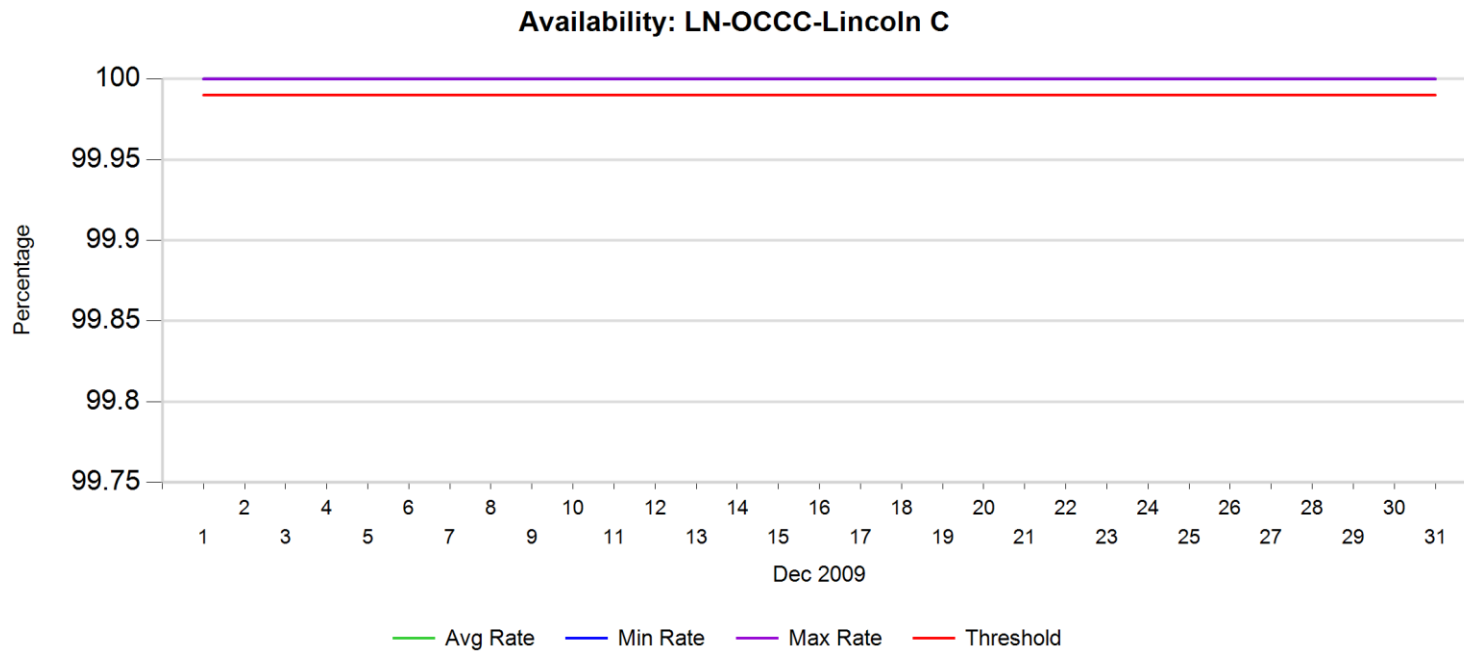
Month	Node Name	Availability TS: >=99.99			Jitter DS TS: <=9.00			Jitter SD TS: <=9.00			MOS TS: >=4.00			Packet Loss DS TS: <=0.30			Packet Loss SD TS: <=0.30			RTT TS: <=90.00				
		MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX		
Sep 2010	Asante RVMC	100.00	100.00	100.00	0.00	2.78	7.70	0.00	2.27	5.60	814.10	0.00	4.34	4.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.80	15.68	27.60
	Bay Area Hospital	0.00	99.95	100.00	0.00	2.86	9.80	0.00	1.67	5.60	0.00	4.34	4.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.20	11.08	32.20	
	Bay-Area-Hospital-WIC	0.00	99.95	100.00	0.00	2.79	17.10	0.00	1.22	6.40	0.00	4.34	4.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	10.87	32.30	
	BMCC-Baker City	100.00	100.00	100.00	0.00	4.59	52.20	0.00	2.17	17.10	0.00	4.34	4.34	0.00	0.00	10.00	0.00	0.00	0.00	0.00	21.30	22.41	66.22	
	BMCC-Pendleton	100.00	100.00	100.00	0.00	3.03	564.30	0.00	2.49	6.50	0.00	4.33	4.34	0.00	0.15	10.00	0.00	0.11	10.00	0.00	14.80	15.95	66.80	
	Columbia Memorial Hospital	100.00	100.00	100.00	0.00	3.03	8.70	0.00	1.20	5.40	0.00	4.34	4.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.70	5.32	37.80	
	ES Test	0.00	98.86	100.00	0.00	4.11	37.90	0.00	5.31	56.00	0.00	4.33	4.34	0.00	0.08	40.00	0.00	0.04	30.00	0.00	3.40	6.09	34.50	
	ES-FireDrill	100.00	100.00	100.00	0.00	1.57	9.90	0.00	0.97	15.30	0.00	4.34	4.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.40	3.18	7.60	
	LaClinica-Hood River	100.00	100.00	100.00	0.00	2.67	54.20	0.00	1.90	40.10	0.00	4.34	4.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.40	19.33	70.20	
	LaClinica-The Dalles	100.00	100.00	100.00	0.00	3.21	26.10	0.00	2.54	12.50	3.50	4.34	4.34	0.00	0.00	0.00	0.00	0.00	10.00	0.00	6.00	6.66	52.10	
	Lake District Hospital	100.00	100.00	100.00	0.00	2.52	52.70	0.00	1.95	6.60	0.00	4.34	4.34	0.00	0.00	10.00	0.00	0.00	0.00	0.00	13.70	15.03	91.30	
	LaPine-Community-Heath	100.00	100.00	100.00	0.00	2.72	13.40	0.00	2.10	6.70	0.00	4.34	4.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.40	9.14	10.90	
	LCHC-LincolnCity	100.00	100.00	100.00	0.00	2.66	7.60	0.00	2.10	7.60	0.00	4.34	4.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.00	10.66	30.00	
	LCHC-Newport	100.00	100.00	100.00	0.00	2.59	8.50	0.00	2.62	7.60	0.00	4.34	4.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.30	9.99	25.80	
	Legacy Health System	100.00	100.00	100.00	0.00	2.90	7.70	0.00	1.92	5.40	0.00	4.34	4.34	0.00	0.02	10.00	0.00	0.00	0.00	0.00	3.20	4.37	5.00	
	Lincoln County Data Center	100.00	100.00	100.00	0.00	2.47	8.10	0.00	2.22	6.70	0.00	4.34	4.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.30	9.94	26.10	
	Lower Umpqua Hospital	100.00	100.00	100.00	0.00	3.04	51.70	0.00	1.85	7.50	0.00	4.34	4.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00	20.00	22.76	72.40
	MCCFL-Tennison	100.00	100.00	100.00	0.00	3.20	6.80	0.00	2.24	6.20	0.00	4.34	4.34	0.00	0.00	10.00	0.00	0.00	0.00	0.00	5.40	5.94	7.60	
	MHCC-Civic	100.00	100.00	100.00	0.00	3.20	8.80	0.00	1.49	5.40	0.00	4.34	4.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.70	4.52	5.60	
	MHCC-Stark	100.00	100.00	100.00	0.00	3.27	8.80	0.00	2.02	5.40	0.00	4.34	4.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.90	4.58	5.40	
	NWMedical-Tillamook	100.00	100.00	100.00	0.00	2.91	7.70	0.00	2.00	5.30	0.00	4.34	4.34	0.00	0.00	0.00	0.00	0.01	50.00	11.40	11.80	13.10		
	OCCC-Lincoln City	100.00	100.00	100.00	0.00	2.98	8.70	0.00	1.52	6.50	0.00	4.34	4.34	0.00	0.00	10.00	0.00	0.00	0.00	0.00	50.00	9.20	10.64	30.11
	OCCC-Newport	100.00	100.00	100.00	0.00	2.51	7.50	0.00	2.57	7.70	0.00	4.34	4.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.30	10.01	19.60	
	OCCC-Waldport	100.00	100.00	100.00	0.00	2.51	569.90	0.00	2.71	7.70	0.00	4.34	4.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.90	10.57	61.90	
	Outside-In	100.00	100.00	100.00	0.00	3.70	76.00	0.00	2.38	20.90	0.00	4.34	4.34	0.00	0.01	10.00	0.00	0.00	0.00	0.00	4.60	6.19	269.20	
	Peace Health	100.00	100.00	100.00	0.00	2.04	15.40	0.00	1.74	5.50	0.00	4.34	4.34	0.00	0.00	0.00	0.00	0.00	0.00	10.00	6.10	6.80	18.80	
	Providence Health	100.00	100.00	100.00	0.00	3.94	11.80	0.00	1.48	5.50	0.00	4.33	4.34	0.00	0.12	20.00	0.00	0.00	0.00	0.00	4.30	5.19	9.70	

Availability

What is availability? Availability indicates the ability of the OHN NOC to “see” your leaf node (Cisco router device at your location).

Why is it important? If the NOC cannot see your leaf node, it means the NOC is receiving no data from you.

When should I worry? Availability should be 100 percent at all times. Anything less indicates a problem.

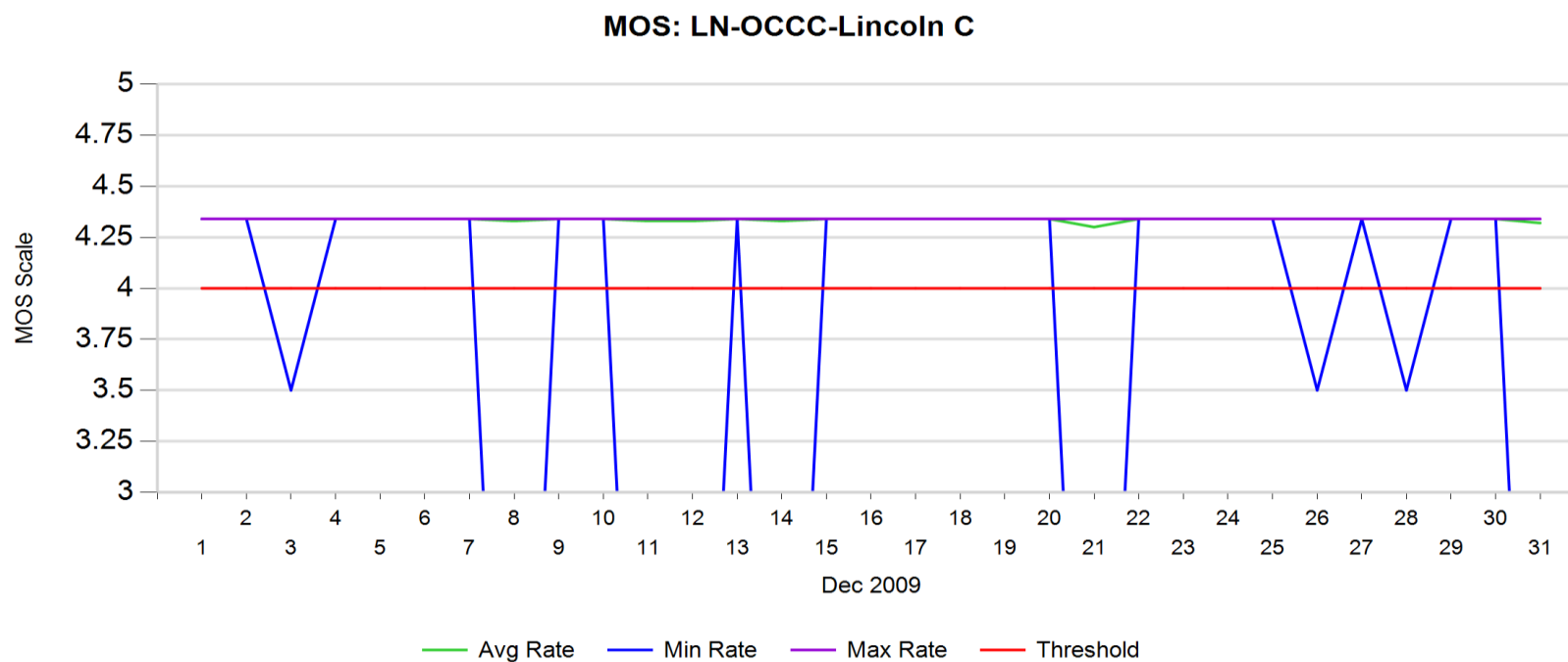


Mean Opinion Score (MOS)

What is a MOS score? Mean Opinion Score is a measure of voice quality over a given link. On a scale from 1 to 5, it is the resulting calculation taken from several data sources.

Why is it important? MOS represents what the experience will be like if you send voice or video over the network.

When should I worry? As indicated by the red line in the graph below, a score of less than 4 means voice quality will be degraded.

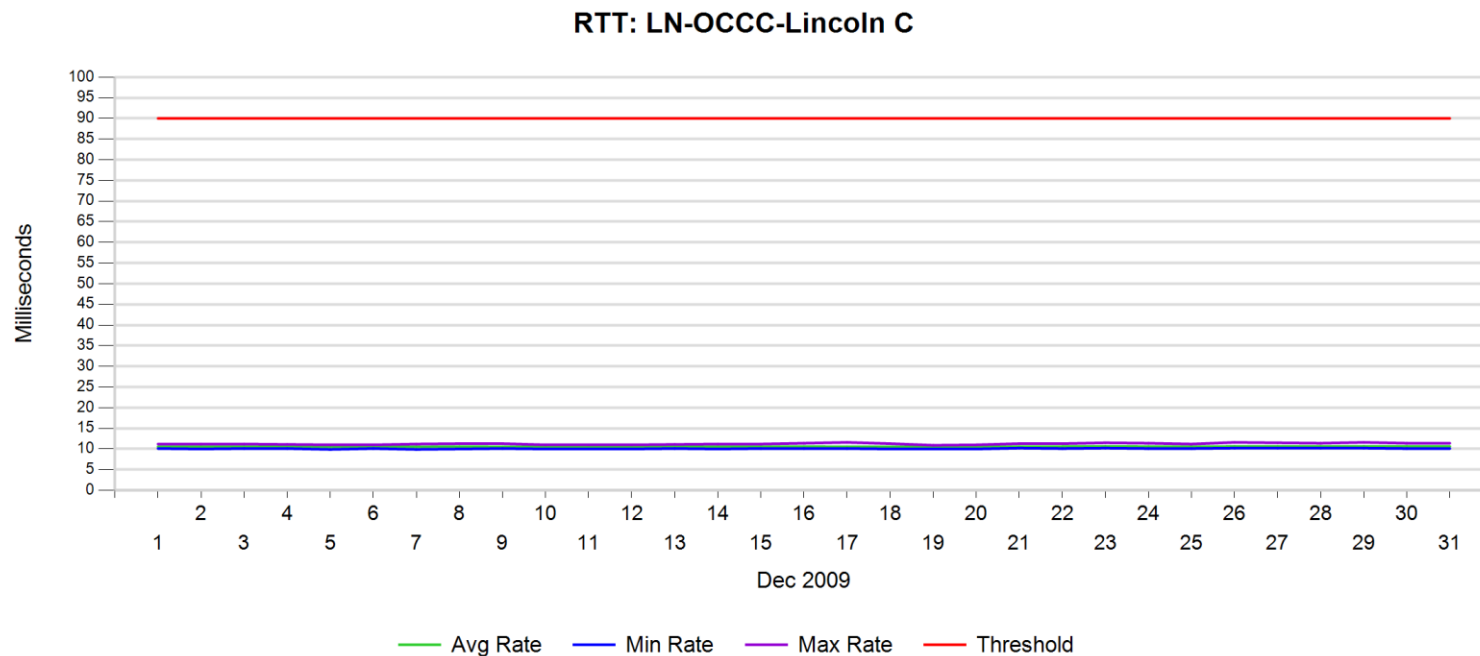


Round Trip Time (RTT)

What is RTT? Round Trip Time (RTT) is the time it takes a signal to leave your leaf node, reach its destination and return to your leaf node.

Why is it important? RTT directly influences how quickly interactive applications respond, such as audio and video transmissions.

When should I worry? As indicated by the red line in the graph below, RTT approaching 90 milliseconds indicates there is a problem that should be analyzed and resolved.

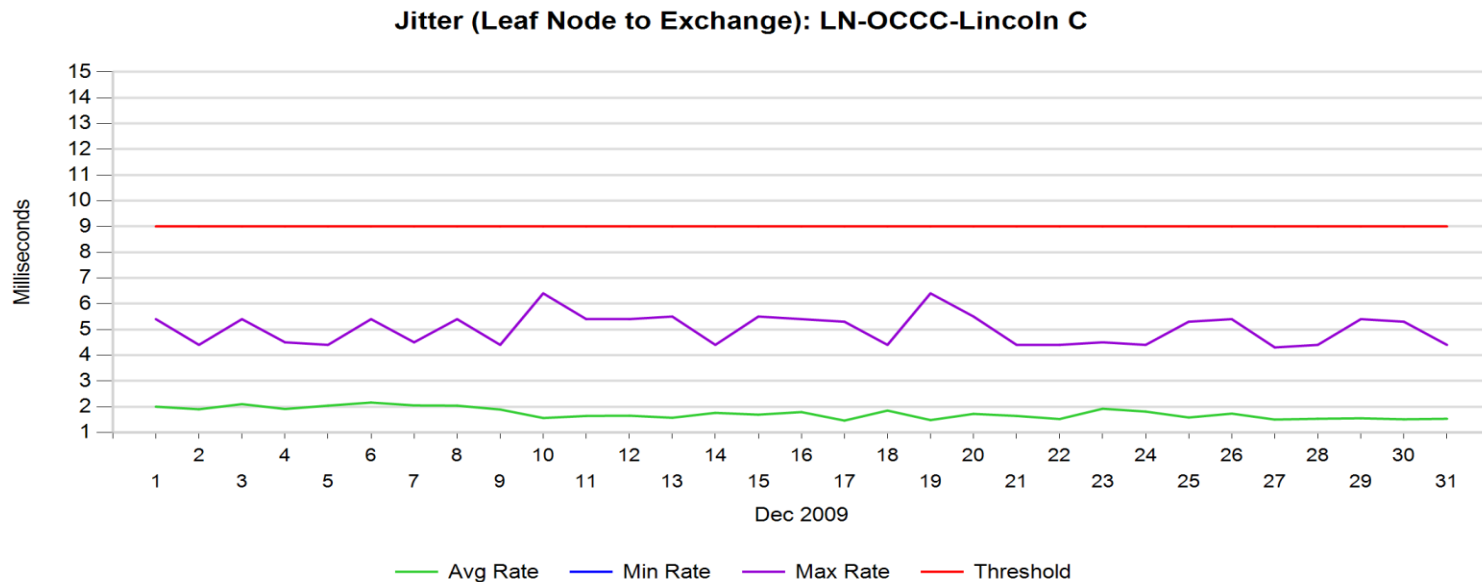


Jitter: Leaf Node to Exchange/Exchange to Leaf Node

What is Jitter? Jitter is the variation in the time between packets being sent and their arrival. Jitter can be caused by network congestion, timing drift, or route changes.

Why is it important? When Jitter occurs, the packets are delivered in the wrong order and, as a result, video and voice communications become garbled and difficult to understand.

When should I worry? As indicated by the red line in the graph below, Jitter approaching 9 milliseconds is a problem that should be analyzed and reviewed.



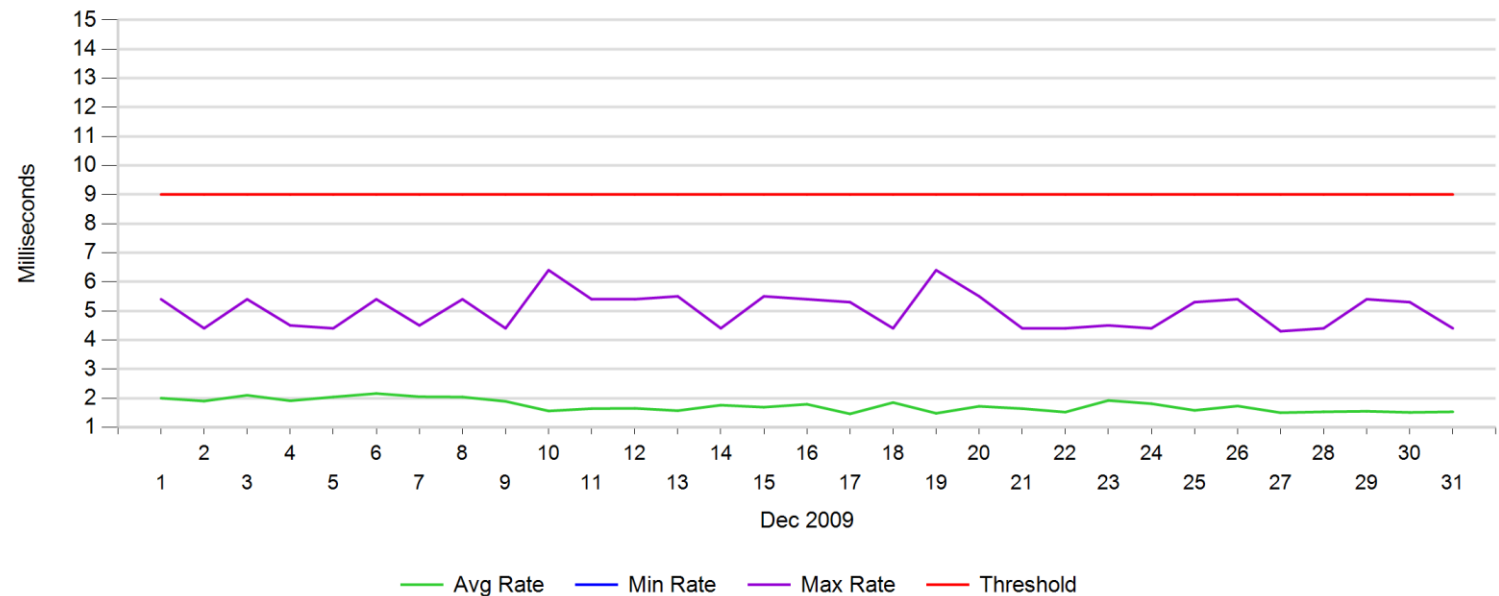
Packet Loss: Leaf Node to Exchange/Exchange to Leaf Node

What is packet loss? A packet is the envelope which contains data to be transmitted over a network. Packet loss is the probability that a packet will be lost in transit from source to destination.

Why is it important? Lost packets require retransmission, which makes data transfer inefficient. The loss of information at the receiving end could result in static in audio or video transmissions.

When should I worry? As represented by the red line in the graph below, steady or frequent packet loss of 0.3 percent or more indicates a problem.

Jitter (Leaf Node to Exchange): LN-OCCC-Lincoln C



What is the process when there is a problem?

Troubleshooting Guidelines

1. ***The OHN NOC works proactively to troubleshoot the OHN Network***

- The NOC will open tickets on a client's behalf once a problem is detected
- The NOC will contact a client via email to let them know a ticket was opened on their behalf
- It is very important to keep your contact information up to date! You can use your portal for this.

2. ***Before opening a ticket...***

- Make sure to have your on-site IT team review the problem and determine if it is a local network/hardware problem or a problem with the OHN Wide Area Network.

3. ***Always contact your vendor first!***

- Your primary point of contact for all troubleshooting should be your vendor
- The vendor will work with the OHN NOC at a high level to quickly isolate and solve any problems
- It is important to develop a relationship with your vendor

4. ***Respond to tickets submitted to you as soon as possible-***

Remember you are part of a network and it is vital that the OHN NOC works to monitor your connection as well as everyone else's so there is no degradation in the overall network viability.

Network Monitoring Scenario

1. Initial Situation

- While monitoring the health of the OHN, the NOC identifies a site that has fallen out of Service Level Agreement (SLA) compliance via our NMS (Network Monitoring System)

Network Monitoring Scenario

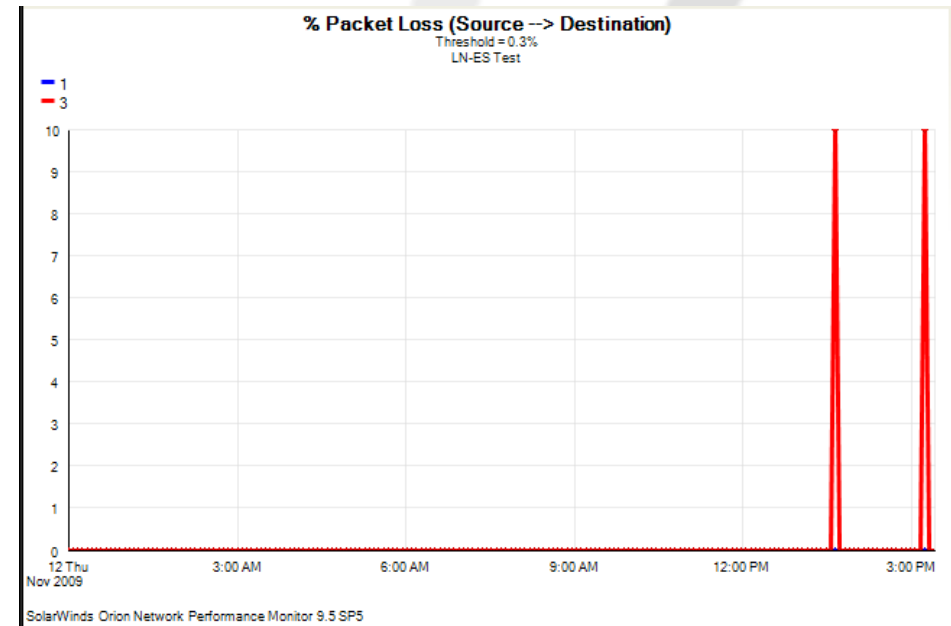
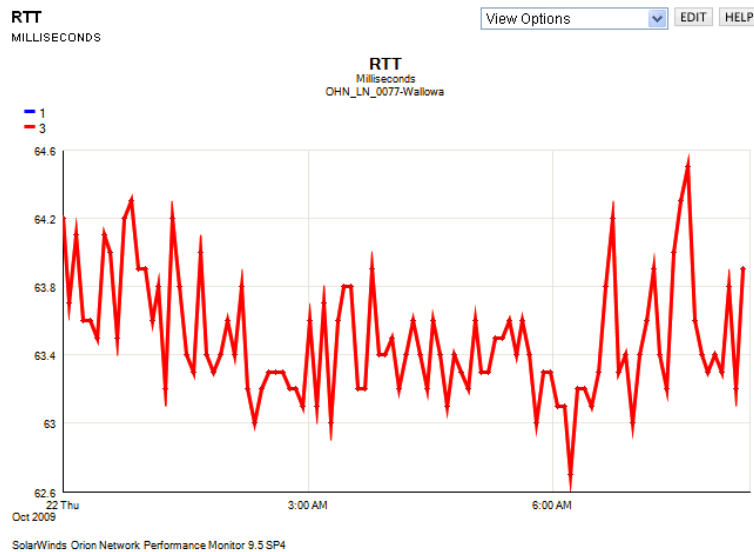
2. Ticket is Issued

- A ticket is auto-generated in our Service Desk System



Network Monitoring Scenario

3. OHN NOC Acknowledges Alert - NOC representative confirms the alert by reviewing the metrics in the NMS



Network Monitoring Scenario

4. NOC Begins Investigation

- Representative uses tools including:
 - Ping
 - Traceroute
 - Other basic network troubleshooting tools

Network Monitoring Scenario

5. Investigation Continued

- The Investigation yields notable packet loss

```
OHN_LN_0079>ping 129.95.255.10
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 129.95.255.10, timeout is 2 seconds:
```

```
!!!
```

```
Success rate is 60 percent (3/5), round-trip min/avg/max = 8/8/8 ms
```

```
OHN_LN_0079#traceroute 129.95.255.10
```

```
Type escape sequence to abort.
```

```
Tracing the route to 129.95.255.10
```

```
1 209.237.73.97 0 msec 0 msec 4 msec  
2 216.110.207.5 56 msec 8 msec 12 msec  
3 216.110.192.22 8 msec 8 msec 8 msec  
4 ***  
5 ***
```

Network Monitoring Scenario

6. Documenting the Issue

- The OHN NOC staff will document the findings in their Service Desk System, which in turn will email the site's technical contact with details
- This documentation will be available for later review by the OHN NOC for SLA compliance reporting of the service providers

Network Monitoring Scenario

7. Escalation

- Escalation will be made to the OHN NOC Network Admin if the situation warrants
- We report our findings to the Service Provider so that they can begin their investigation into the matter
- We provide any metric data that we have collected that may assist the Service Provider in finding a resolution

OHN NOC Reports and Use

- In case of an escalated issue per the previous scenario, your NOC reports can be used to enforce your vendor contract terms
- Your standard monthly reports can spot consistent good performance or problematic trends/issues

Using Your NOC Reports: Posted monthly on your portal

What is the value of these reports?

- The OHN monitoring system only measures vendor performance.
- The reports provide a 3rd party non-biased view of your OHN vendor performance that does not include site related outages or issues.

How often should I check these reports?

- It is important to always review these reports on a monthly basis since most SLA contracts specify a time limit for compensation claims.

How should I use these reports?

- Gain a detailed view of your OHN vendor's performance.
- Determine if your contractual SLA standards are being met or if you are eligible for compensation as per your contract.
 - Please note that any such claims must come from the participating OHN site directly since OHN is not a party to your vendor contract.

Whom should I contact if I have questions?

- Contact the OHN NOC directly at 503-213-5400 or at ohnnoc@easystreet.com

Using your OHN Web-Based Site Portal

Portal Overview

1. Features & Security

- Each OHN provider (site) and vendor is issued its own web-based Site/Vendor Portal, with authorized login permissions
- A web based area for staff, sites and vendors to:
 - Easily manage and process the FCC RHCPP invoices with OHN customized/developed RHCPP workflows
 - Provide an organized, centralized and trusted repository for real-time access to core documentation that will be requested for FCC RHCPP audits
 - Gain easy access to monthly NOC reports, and real-time NOC activity
 - Receive emergency alert/notifications (email and phone)
 - Much more to come in the future such as centralized access to:
 - Other OHN participants; learning what new telemedicine/HIT programs they're working on and the opportunity to reach out to them to expand your referral patterns/partnerships
 - Best practices surrounding health information technology (HIT), how to use your connection, trends

2. Demo of Portal



What do other sites use the connection for?

Needs & Uses: What OHN Participants Say

- ***Telemedicine & HIT Applications***

- Utilize video conference technology for training or consultations
- Utilize new technologies dependent upon high-speed, reliable broadband technology
- Most common uses/interests:
 - Continuing medical education (CME)
 - Diagnosis (teleradiology, telecardiology, mental health, routine clinical consultations)
 - Emergency consultation & triage
 - Follow-up
 - Administrative

- ***Operational Efficiency***

- Improve file transfer times
- Ability to bring in services from other partners that were previously unavailable due to bandwidth constraints
- Faster and more reliable connectivity to data center/server locations for improved processing times

- ***Increase and/or Improve upon State-wide Referral Patterns***

- Hospitals
- Clinics
- Payers
- Public Health
- Community Colleges
- Allied Health/Long-term Care Facilities
- Pharmacies

Using & Getting the Most out of your OHN Connection

DON'T WAIT!! The sooner you engage in using your new OHN connection the quicker you will begin reaping the benefits. We recommend you begin planning for full utilization as soon as you sign your contract with the vendor. Also we have to show demonstrated use to the FCC to back up their investment... **WE HAVE TO REPORT ON THIS!**

Implement your plan or create a plan to:

1. **Cut traffic over** to your new OHN circuit as soon as it is installed
 - List any current partners on the OHN Network that you connect with and discuss with them connecting to them on your new OHN circuit.
 - A list of current participants can be found here: www.oregonhealthnet.org
 - Work with the NOC & OHN staff to measure your connection before/after go-live
2. **Clarify current (and mid-term) uses/applications** to run on the network
 - Identify, communicate and clarify with leadership in your organization on the operations, clinical and IT side of the house as to what they would like to run on OHN
 - Prioritize running applications on your network that you currently use – before you begin or wait to deploy a new application/service
 - Identify a mechanism to report upon your uses of the network, which is an auditing requirement for all sites who have benefitted from the RHCPP subsidy; they want to know you're using your connection
3. **Get help with reaching out** to other current/future OHN participants
 - Let us know if you have questions or need any assistance reaching out to other OHN participants—
We're here to help!

OHN Supports Your Use of the Network: How to Use the OHN Welcome Guide

1. We have put together a comprehensive Welcome User Guide which gives an overview of the network, preparing for installation, using the network, configurations and much more
2. Please review Section 4 of the Welcome User Guide “*Using the network*” which gives detail on making the most of your OHN connection
3. The entire Guide is available on our website,
http://www.oregonhealthnet.org/sites/ohn.osuosl.org/files/ohn_welcomeuserguide_110107.pdf
4. We also send the Welcome Guide to you directly:
 - Via email when your funding commitment letter (FCL) is received
 - Via email when your installation is completed
 - Via FedEx included in the Cisco router (Leaf Node) shipment

Next Steps!

1. Use the Network!

- Your connection to the OHN brings access to a growing number of health care and education providers across the state
- Provide the best access to your patients by reaching out and implementing your strategy for growing your telemedicine program
- Meet the growing FCC/USAC demands and requirements for proof of use of the network for your future audits

2. Educate all key members in your organization about OHN

- It is important that your site use the network and educate members across your organization about the benefits and value of the network
- Enroll or download in our helpful 4-part webinar orientations

3. OHN resources to help you and your team

- 5 Orientations (have the right people attend them all!)
<http://www.oregonhealthnet.org/resources/siteorientations>
- Your Site Portal – this is your “go-to” for invoicing, reports, messages, and other valuable content/information
- Your Welcome Guide -
http://www.oregonhealthnet.org/sites/ohn.osuosl.org/files/OHN%20Welcome%20User%20Guide_final_1.pdf
- Staff (see next slide for roles and contact information)

OHN Staff Contact Information

General Account & RHCPP Questions:

Kim Klupenger, *Operations Director*
kklupenger@oregonhealthnet.org
503.781.7929

RFP & Technical Questions:

Peter Trnavskis, *IT Project Manager*
ptrnavskis@oregonhealthnet.org
(503) 344-3744

Information Technology & Use Questions:

Monica Koiv, *IT Client Services*
mkoiv@oregonhealthnet.org
(503) 344-3759

Post-RFP Award Process Questions:

Deborah Galiel, *Assoc. Project Coordinator & Office Mgr.*
dgaliel@oregonhealthnet.org
503-344 -3741

Legal/ Contract Questions:

Kim Klupenger, *Operations Director*
kklupenger@oregonhealthnet.org
503.781.7929

General OHN/Program Questions:

Kim Klupenger, *Operations Director*
kklupenger@oregonhealthnet.org
503.781.7929

Network Service Issues:

NOC Helpdesk
ohnnoc@easystreet.com

OHN Participation Fees & Billing Questions:

Kim Klupenger, *Operations Director*
kklupenger@oregonhealthnet.org
503.781.7929

OR

Deborah Galiel, *Project Coordinator & Office Mgr.*
dgaliel@oregonhealthnet.org
503-344 -3741