CA Enterprise Management – Deployment Guide

CA UIM with NFA for Managed Service Providers (MSPs)

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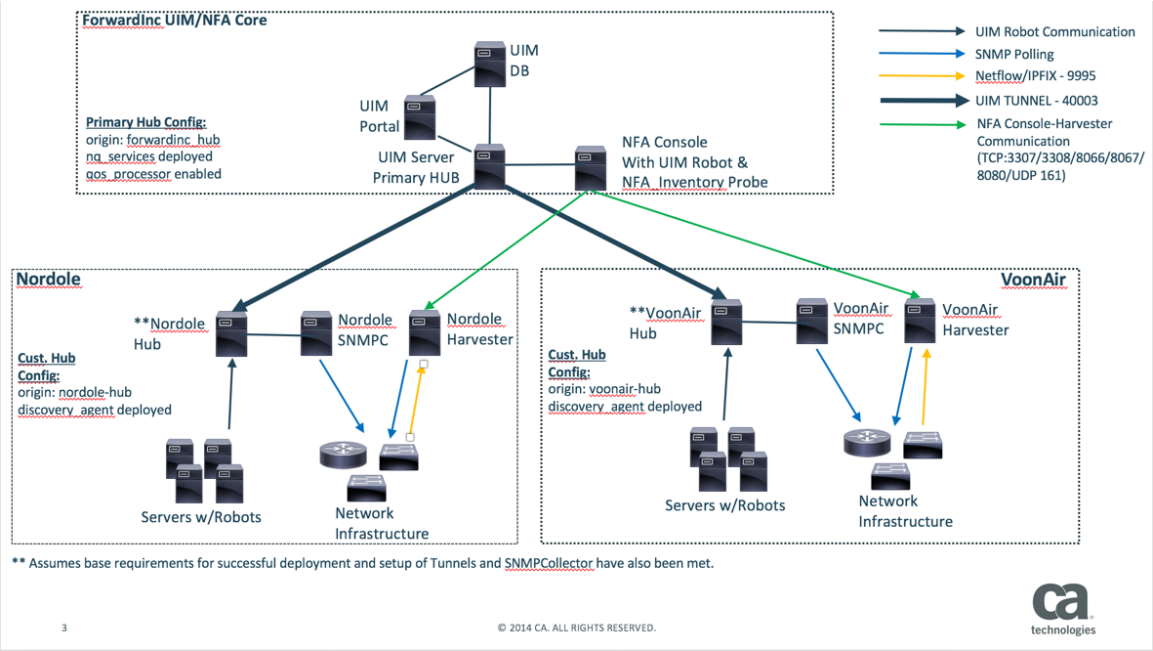
Executive Summary

CA Network Flow Analysis (NFA) is a network traffic monitoring solution that can help you optimize your network infrastructure for better application performance. With enhanced visibility into your network's applications, hosts, conversations and QoS information, you can proactively manage your network to reduce outages, solve problems faster and ensure efficient and cost-effective operations. When NFA is combined with CA Unified Infrastructure Management (UIM) for Network, the total solution provides complete visibility into Network Health for IT infrastructure.

For MSPs to leverage this solution, a foundational element to success is tenancy. The two components of the solution (UIM/NFA) have different mechanisms for leveraging tenancy and bringing these two products together to offer a holistic multi-tenant solution is not straightforward. With that in mind, the steps below explain the process for deploying CA UIM with CA NFA to offer a complete solution in a multi-tenant configuration.

Sample Environment

The following diagram depicts a sample architecture for deploying UIM/NFA with Multi-tenancy. The deployment consists of the core UIM/NFA infrastructure deployed at a MSP (ForwardInc), managing two customers (Nordole and VoonAir). Nordole and VoonAir are running UIM Components (Secondary Hub and SNMPCollector) and NFA Components (Harvester) on premise to monitor their network and systems infrastructure.



Tested Versions

The following versions were used to create this deployment guide:

- Unified Infrastructure Management (UIM) 8.4
- Network Flow Analysis (NFA) 9.3.3
- NFA_Inventory Probe 1.30
- NQ_Services Probe 1.20
- SNMPCollector 3.11

To enabled UIM with NFA with Multi-tenancy the minimum supported versions are UIM 8.31, NFA 9.3.2, NFA Inventory Probe 1.10 and NQ_Services Probe 1.0.

NFA Sizing:

NFA is sold per device, and scales horizontally by adding additional harvesters to support the devices sending flow data. The rule of thumb is 1000 devices per harvester with ~24 harvesters per NFA console. However, the metric that truly drives performance and scale for NFA is flow rate. Each harvester can handle a max of ~9million flows per minute. The flow rate per harvester can be viewed from the NFA UI – Administration – Flow Statistics page. More information on NFA sizing can be found at https://docops.ca.com/display/NFA933/System+Recommendations+and+Requirements.

Alerting:

NFA has the capability to send SNMP traps when application traffic exceeds a threshold for an interface or group of interfaces. To support this capability with UIM, you must deploy and configure the snmptd probe to support NFA. The configuration will require uploading the NFA mib file stored on the NFA console at [NFA INSTALL DIRECTORY]\REPORTER\MIB to the snmptd probe.

Caveats:

Overlapping Router IPs:

The current GA version of NFA (9.3.3) does not support routers that have overlapping management addresses. Management addresses consist of those addresses that are known to the system. In NFA's case that would be the Export Source, in UIM's case that would be the Polled IP. So given that NFA does not support this capability, neither does the UIM/NFA integration. Again, this does not mean that the hosts/conversations i.e. traffic flows cannot have overlapping IP addressing, just that the router management IPs cannot. This capability is expected to be addressed in a future release of NFA.

Custom NFA Interface QOS Enrichment:

NFA has interface types that are specific to NFA only. Examples of these are Broadcast/Multicast Interface, Interface Aggregations, and Custom Virtual Interfaces(CVIs). Since these interfaces are specific to only NFA and not able to be monitored via SNMPCollector, QOS enrichment cannot be completed for these interface types. Which also means that you will not see these interfaces show up under the customer views in USM. However, they will be in NFA for the devices that they are associated with.

Deployment Process:

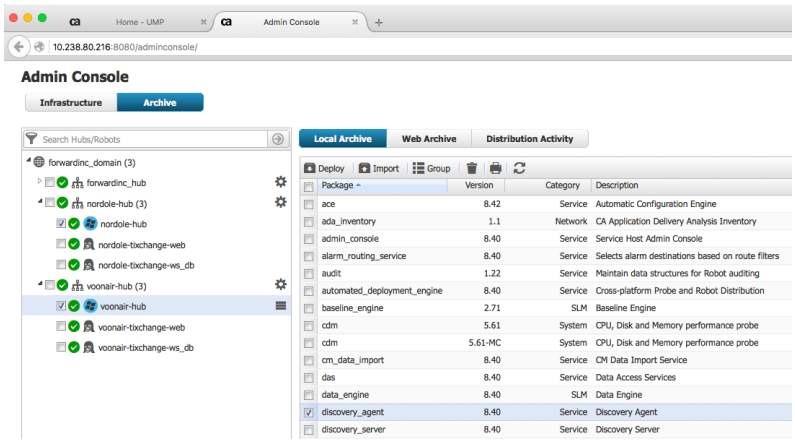
The following pre-requisites should be completed prior to following the deployment process:

- UIM 8.4 base installation has been successfully completed.
- Remote Hubs are installed and successfully communicating over a tunnel back to the primary hub.
- Remote Hubs are configured with the appropriate customer origin.
- SNMPCollector and all dependent probes are installed (but not configured) at each customer location.
- NFA two-tier install with harvesters at each customer location has been completed and Netflow data is successfully being shown in the NFA UI.

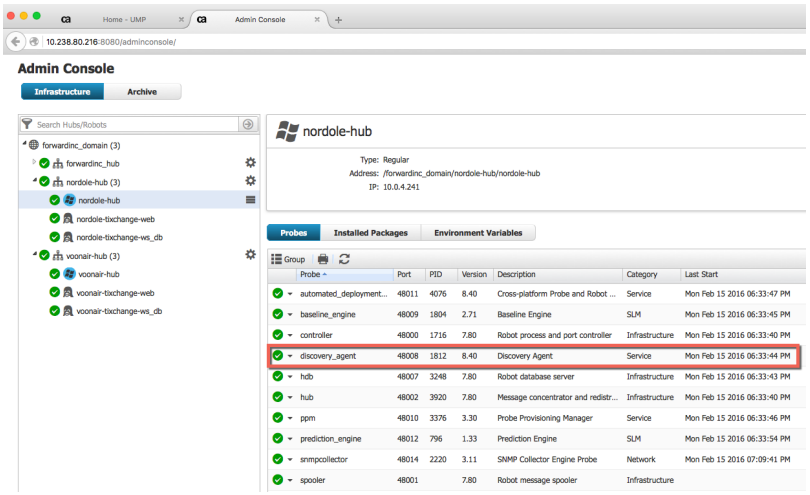
Discovery Steps (ForwardInc MSP):

Step 1. Deploy discovery_agent to Nordole and VoonAir's on premise hub.

A. Open Admin Console – Select Archive – Select Nordole-Hub & VoonAir-Hub – then select discovery_agent package and click deploy.



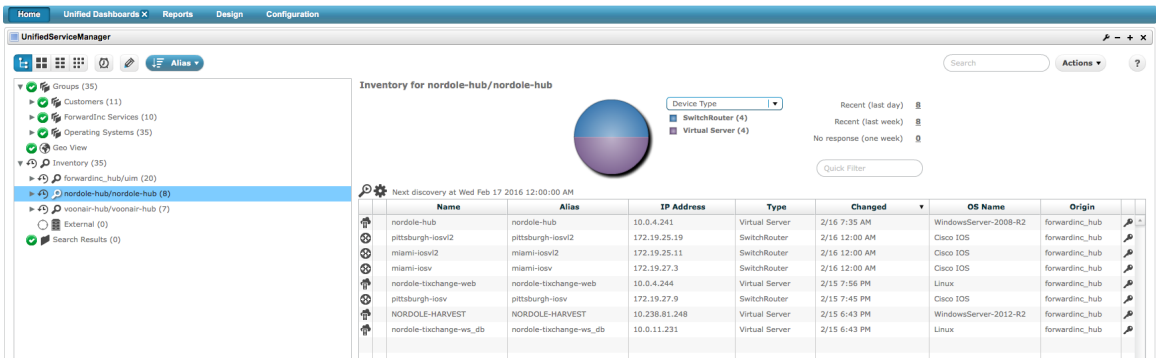
B. Validate discovery_agent has successfully started on both Nordole and VoonAir hubs.



Step 2. Configure and Execute a Discovery for both Nordole and VoonAir.

A. Login to UMP and Click on the Discovery Wizard for Nordole.
B. (Minimally) Add SNMP Credentials and Network Range Scope for the desired network devices that will be monitored via SNMPCollector and will be sending flow data.
C. Run the discovery now, and reschedule discovery to detect changes at the desired interval.

D. Validate devices have successfully been discovered.

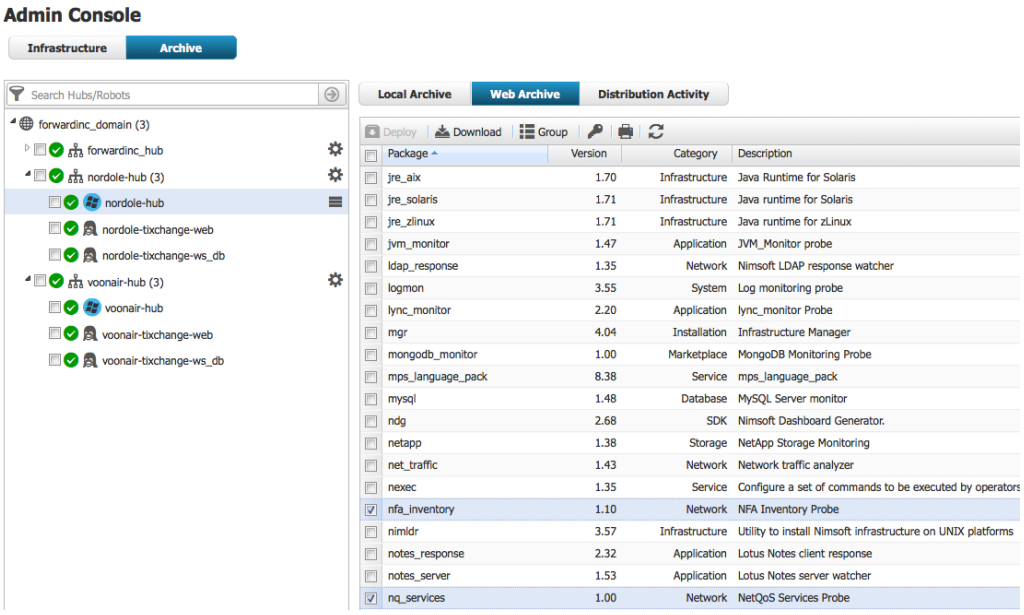


E. Execute same process for VoonAir.

NFA Steps (ForwardInc MSP):

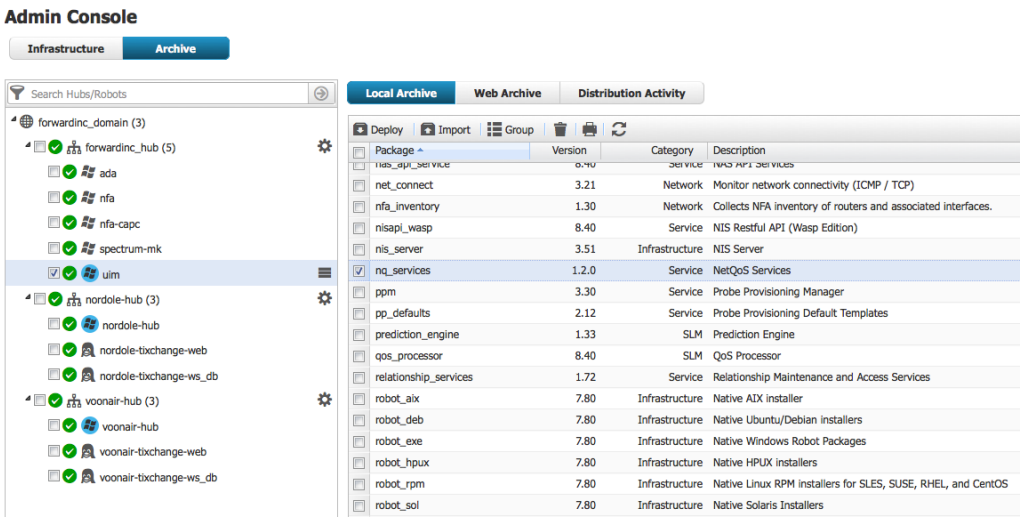
Step 1. Download NQ_Services 1.20 and NFA_Inventory 1.30 from the Web Archive.

A. Open Admin Console – Click Archive – Web Archive – Select NFA_Inventory and NQ_Services and Click Download

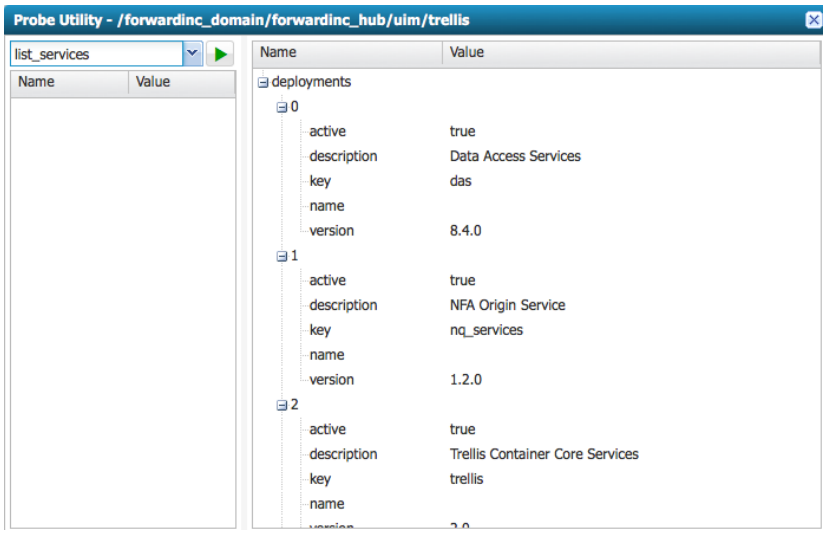


Step 2. Deploy nq_services probe to the primary hub where trellis is located.

A. Open Admin Console – Select Archive – Select the primary hub – then select nq_services package and click deploy.

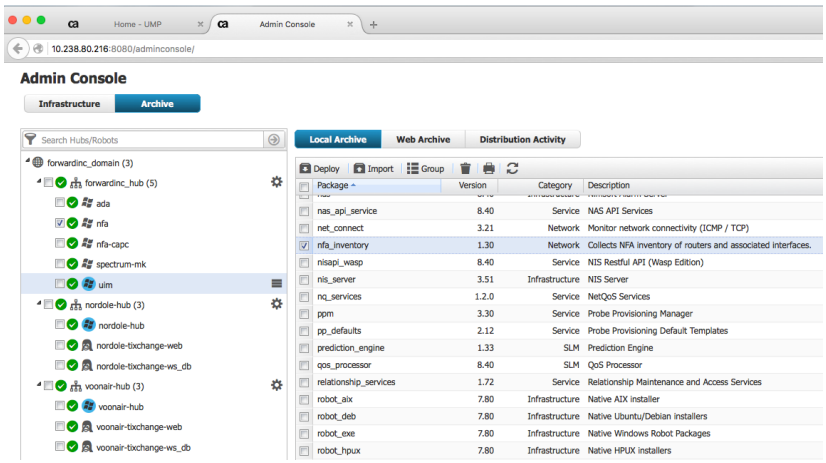


B. Validate nq_services probe is active. Open Admin Console – Select Infrastructure – Select the primary hub –Select Trellis Probe – Select Probe Utility – Choose List Services – Click Green Arrow – Look for NQ Origin Service and Active = True.

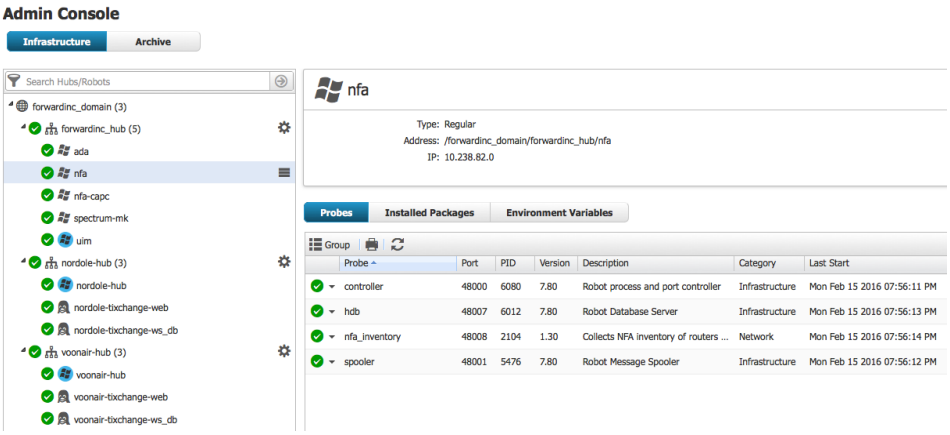


Step 3. Deploy and configure nfa_inventory probe to the NFA Master Console.

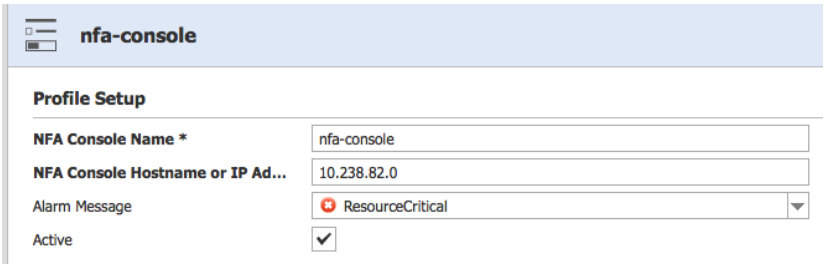
A. Open Admin Console – Select Archive – Select the NFA Robot – then select nfa_inventory package and click deploy.



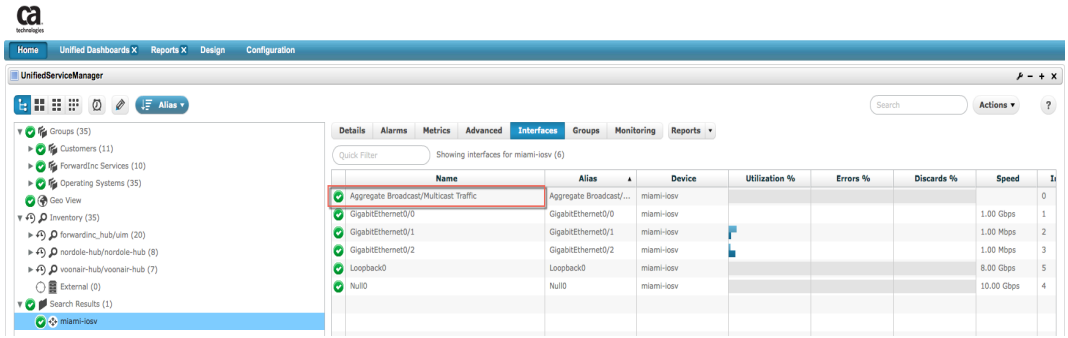
B. Validate nfa_inventory probe has successfully started on NFA Console.



C. Configure nfa_inventory probe. Admin Console – Select NFA Robot – Select NFA Inventory – Select Configure – Click Add Console – Add Console Name and IP Address – Click Submit – Click Save



D. Validate NFA Inventory in UMP – In UMP – Select Router that is in NFA – Click Interface tab – Look for Aggregate Broadcast/Multicast Interface in the list



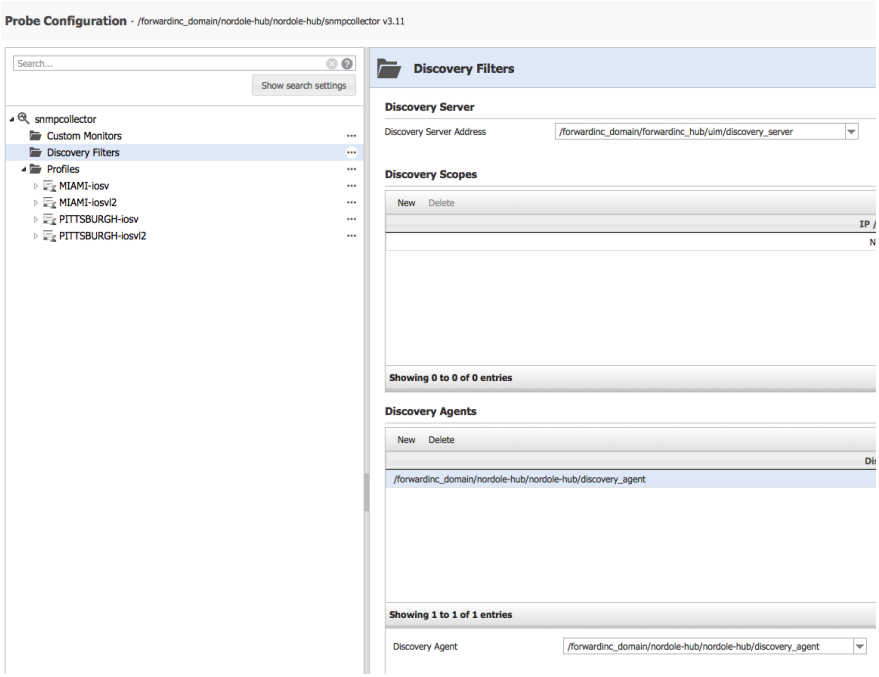
E. Validate NFA Data in UMP - Select Router that is in NFA – Click Interface tab – Select Interface. The first graph (BitsIn/BitsOut) will not show until SNMP is configured.

SNMPCollector (Customer Nordole):

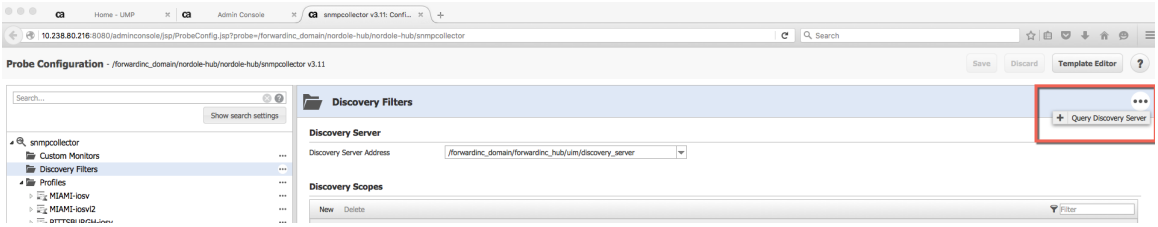
Step 1. Configure SNMPCollector

A. Admin Console – Select SNMPCollector Robot – Select SNMPCollector Probe - Configure

B. Create Discovery Filter for appropriate for Nordole discovery_agent

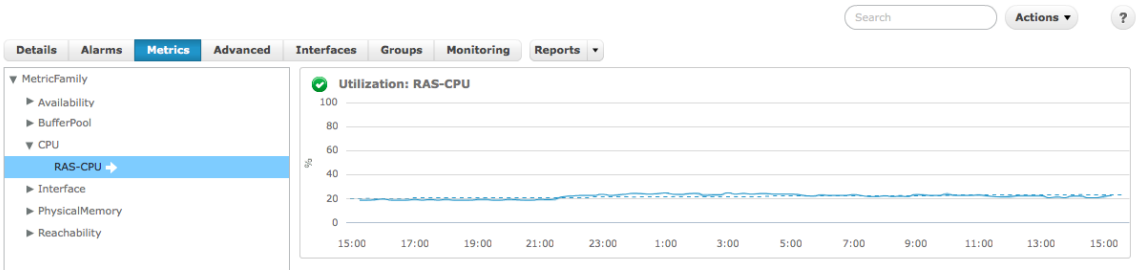


C. Query Discovery Server for devices to begin discovery and polling of Nordole devices.



Step 2. Validate SNMPCollector Data

A. Validate SNMP data for Nordole devices. – Wait 15min after querying the discovery server – In UMP – Select Nordole Network Device – Select Metrics Tab – Expand Metric Family – Select CPU -



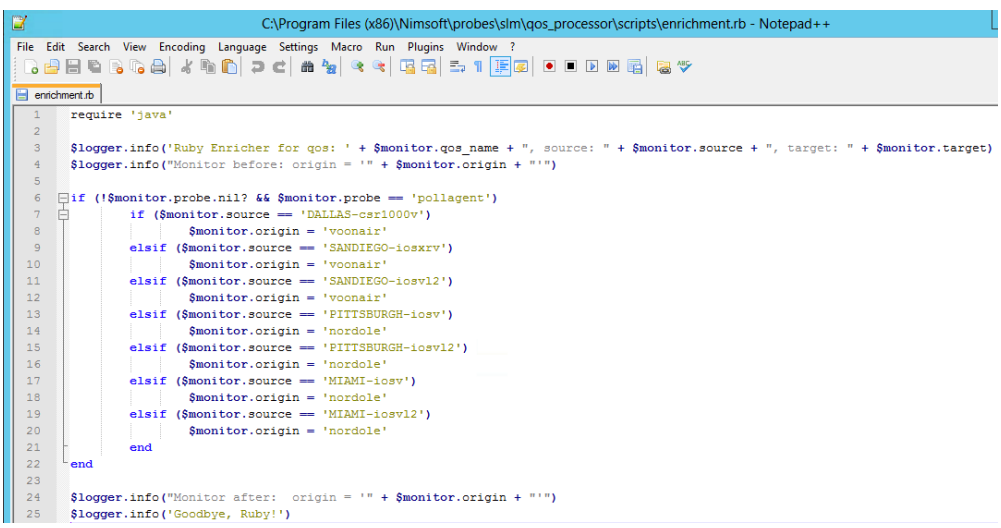
B. Once Nordole SNMP devices have been validated, Repeat Steps for VoonAir.

QOS Enrichment Steps (ForwardInc MSP):

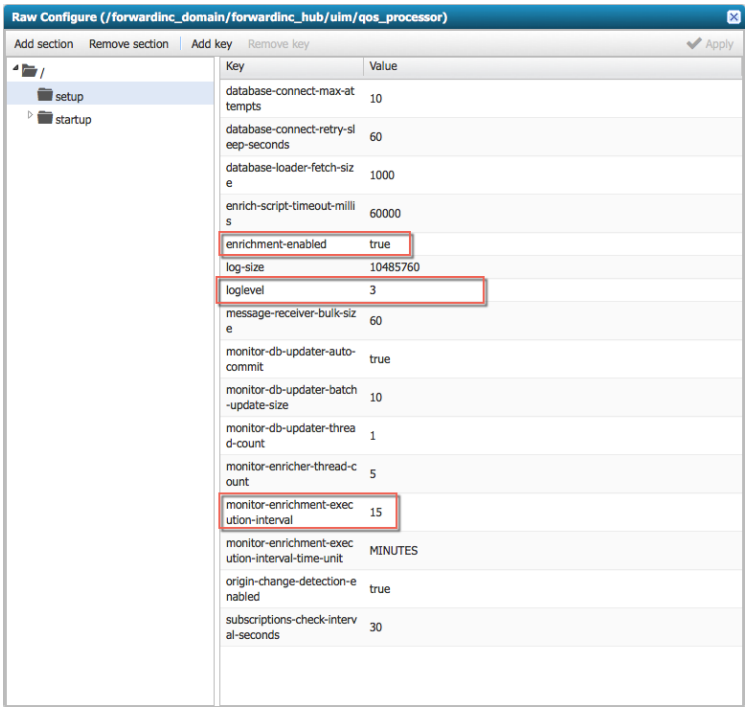
Step 1. Create Ruby Script and Enable qos_processor

A. Create enrichment.rb ruby script to enrich the devices with the appropriate origins.

Example Script:



B. Copy enrichment.rb script to qos_processor scripts directory. Ex: C:\Program Files (x86)\Nimsoft\probes\slm\qos_processor\scripts
C. Configure and Enable qos_processor – Admin Console – Select Primary Hub – Select Qos_Processor Probe – Select Raw Configure – Change Log Level to 3, Enrichment-Enabled to true and and Monitor-Enrichment-Execution-Interval to 15 minutes.

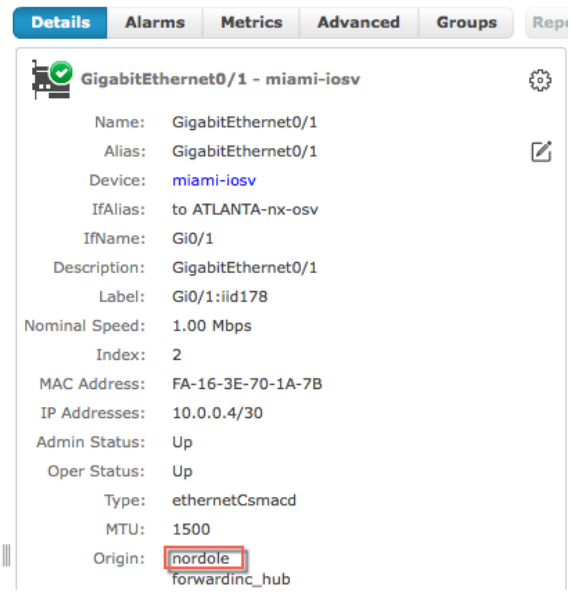


Step 2. Validate Origin Enrichment

A. Log File Method – Admin Console – Select Primary Hub – Select qos_processor - View Log File – Look for entries such as:

```
#3, qos_processor] Ruby Enricher for qos: QOS_INTERFACE_UTILIZATIONOUT, source: PITTSBURGH-iosvl2, target: Gi0/0(GigabitEthernet0/0)
#3, qos_processor] Monitor before: origin = 'forwardinc_hub'
#3, qos_processor] Monitor after:  origin = 'nordole'
```

B. UI Method – In UMP – Select Network Device – Select Interface Tab – Select Interface – Look for modified origin:

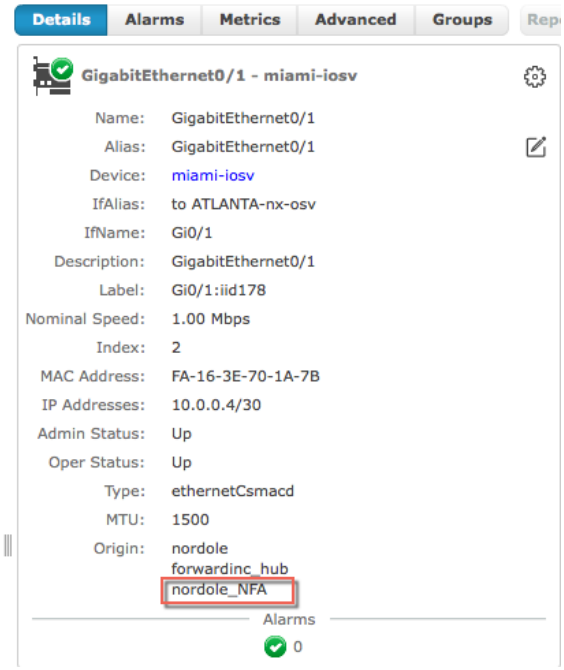


Step 3. Validate Origin to NFA Interface Group Mapping

A. Log File Method – Admin Console – Select NFA Robot – Select nfa_inventory probe - View Log File – Look for entries such as:

```
Feb 15 20:01:21:604 [interfaceToOriginMapping, nfa_inventory] About to map NFA interfaces to UIM origins.
Feb 15 20:01:22:187 [interfaceToOriginMapping, nfa_inventory] Processing interface 175 with 1 origins
Feb 15 20:01:22:187 [interfaceToOriginMapping, nfa_inventory] Found origin nordole for interface 175
Feb 15 20:01:22:187 [interfaceToOriginMapping, nfa_inventory] Found origin voonair for interface 172
Feb 15 20:01:22:187 [interfaceToOriginMapping, nfa_inventory] Processing interface 173 with 1 origins
Feb 15 20:01:22:187 [interfaceToOriginMapping, nfa_inventory] Found origin voonair for interface 173
Feb 15 20:01:22:188 [interfaceToOriginMapping, nfa_inventory] Processing interface 201 with 1 origins
Feb 15 20:01:22:188 [interfaceToOriginMapping, nfa_inventory] Found origin nordole for interface 201
Feb 15 20:01:22:188 [interfaceToOriginMapping, nfa_inventory] Processing interface 179 with 1 origins
Feb 15 20:01:22:188 [interfaceToOriginMapping, nfa_inventory] Found origin nordole for interface 179
Feb 15 20:01:22:188 [interfaceToOriginMapping, nfa_inventory] Processing interface 178 with 1 origins
Feb 15 20:01:22:188 [interfaceToOriginMapping, nfa_inventory] Found origin nordole for interface 178
Feb 15 20:01:22:188 [interfaceToOriginMapping, nfa_inventory] Processing interface 176 with 1 origins
Feb 15 20:01:22:188 [interfaceToOriginMapping, nfa_inventory] Found origin nordole for interface 176
Feb 15 20:01:22:188 [interfaceToOriginMapping, nfa_inventory] Origin: nordole Interfaces: 201, 175, 178, 179, 176,
Feb 15 20:01:22:188 [interfaceToOriginMapping, nfa_inventory] Origin: voonair Interfaces: 173, 172,
```

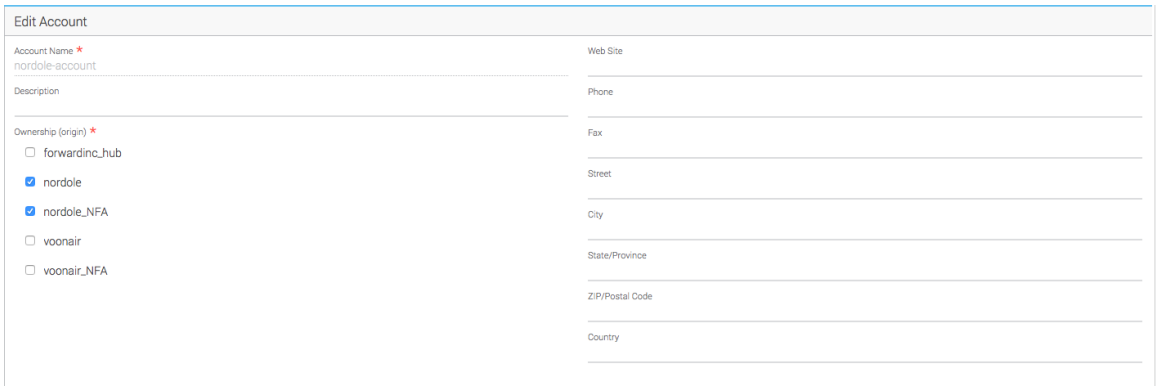
B. UI Method – In UMP – Select Network Device – Select Interface Tab – Select Interface – Look for modified origin with _NFA



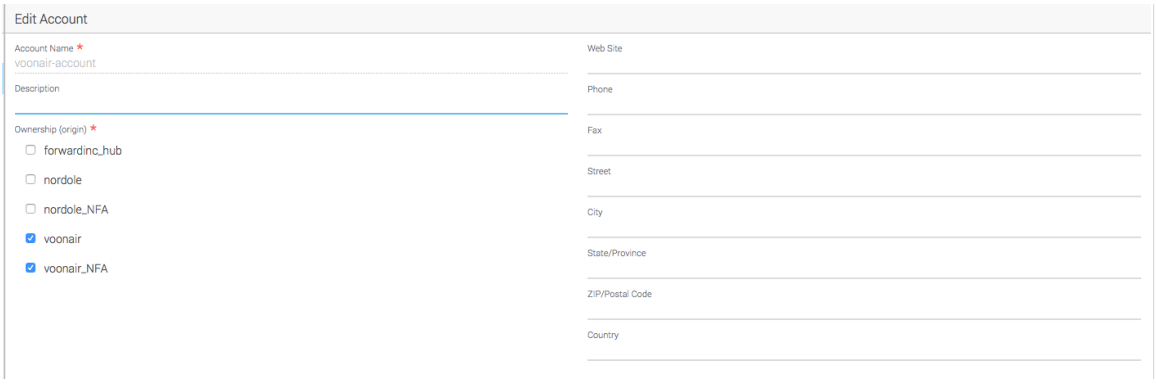
Create Customer Access (ForwardInc MSP):

Step 1. Create UIM Accounts for each customer.

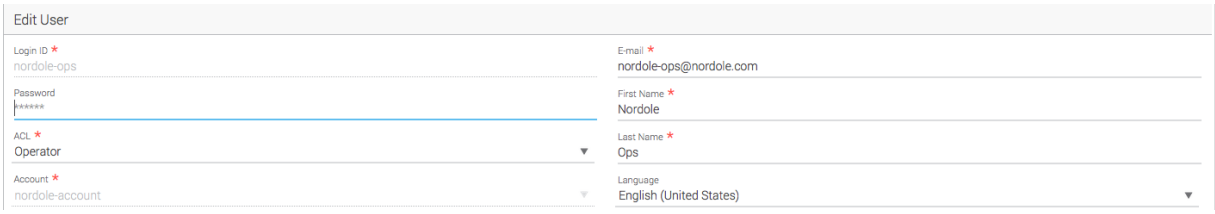
A. In UMP – Click Configuration – Accounts – Click + to add account – enter nordole-account for Account Name – Select nordole and nordole_nfa for origins and click create.



B. In UMP – Click Configuration – Accounts – Click + to add account – enter voonair-account for Account Name – Select voonair and voonair_nfa for origins and click create.



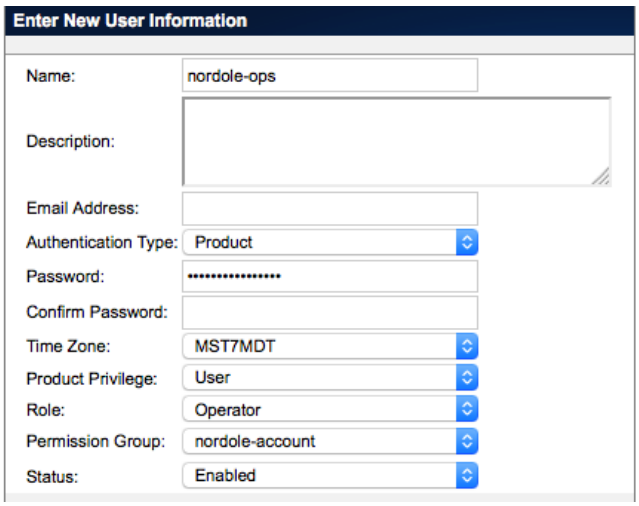
C. Add User to Account - In UMP – Click Configuration – Accounts – Select nordole-account – click + sign to add user. Enter Login ID, Password, Confirm Password, ACL, Email, First and Last Name and click create. Example Nordole User:



D. Repeat Steps to create a new voonair user mapped to voonair-account.

Step 2. Provision UIM Customer Account Users to NFA Master Console

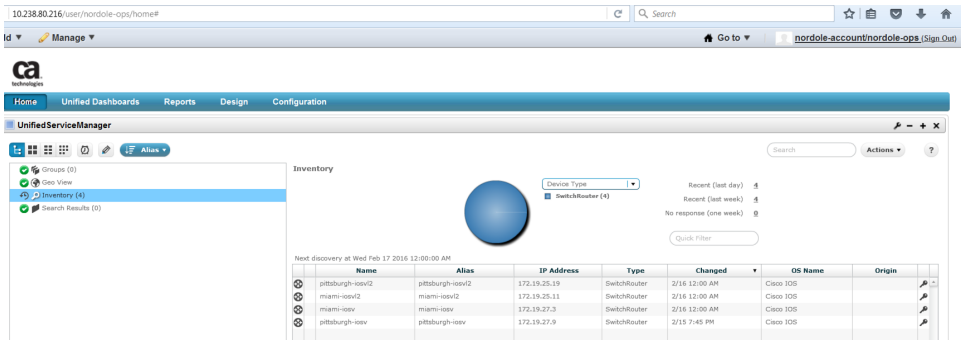
A. In NFA Console – Click Administration – Click Users – Click New – Enter same username and password as used in Step 1 – Item C. All other information can remain default. Note: If username and password are not the same drill-out from UIM will not work. Example NFA User after successful drill out:



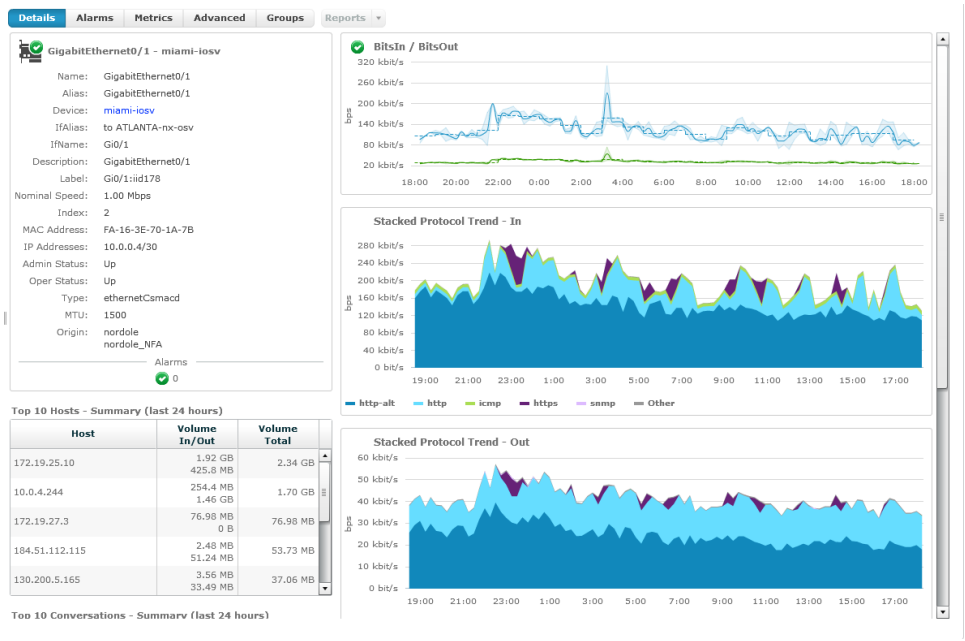
B. Repeat steps for VoonAir Users:

Step 3. Validate UIM to NFA workflow for Customers

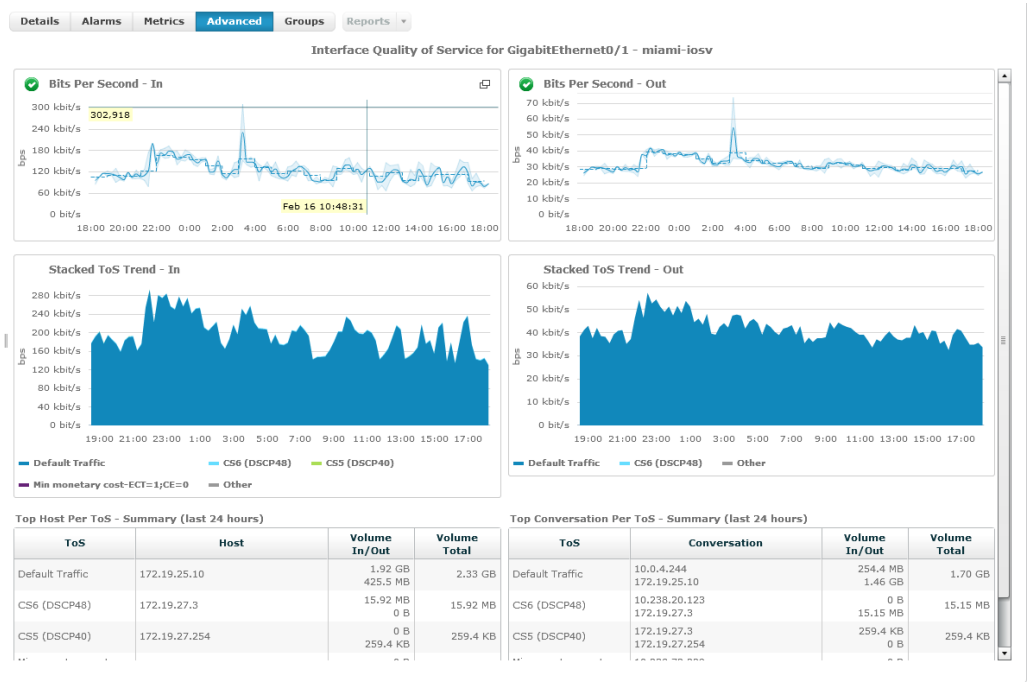
A. In UMP, Login as nordole-ops user and validate inventory only contains devices for the Nordole customer.



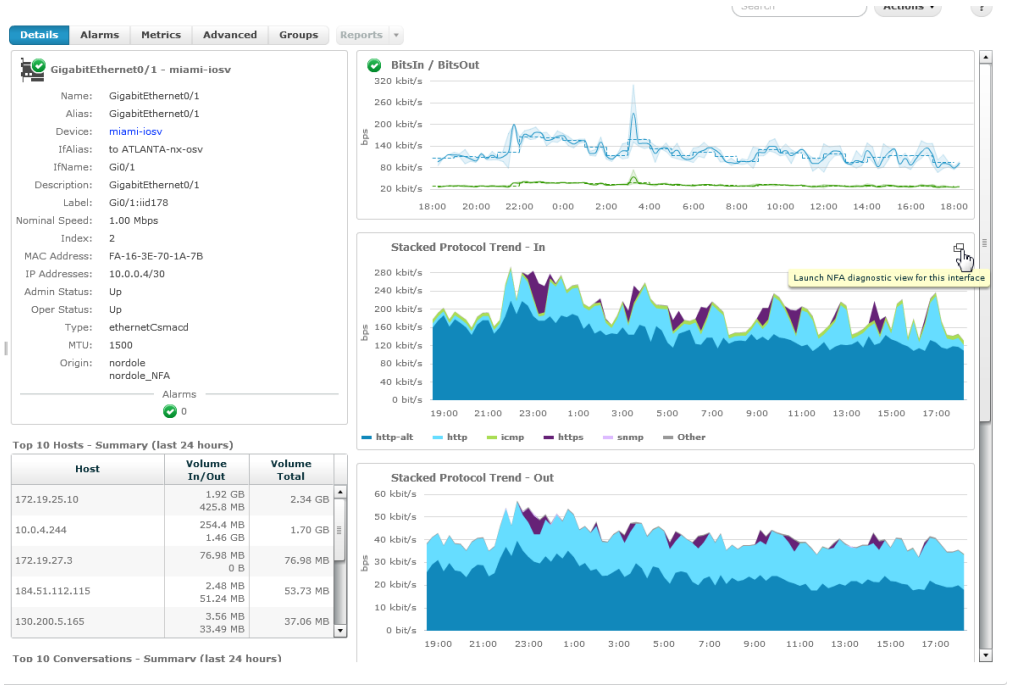
B. Validate "Interface Details" (SNMP/Flow data) for an interface on a Nordole device.

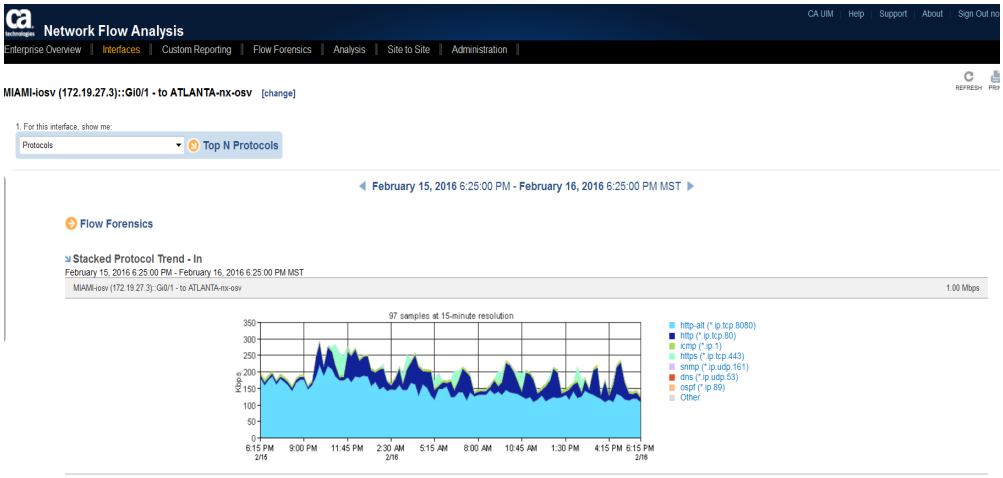


C. Validate “Advanced Tab” (SNMP/ToS - Flow data) for an interface on a Nordole device.

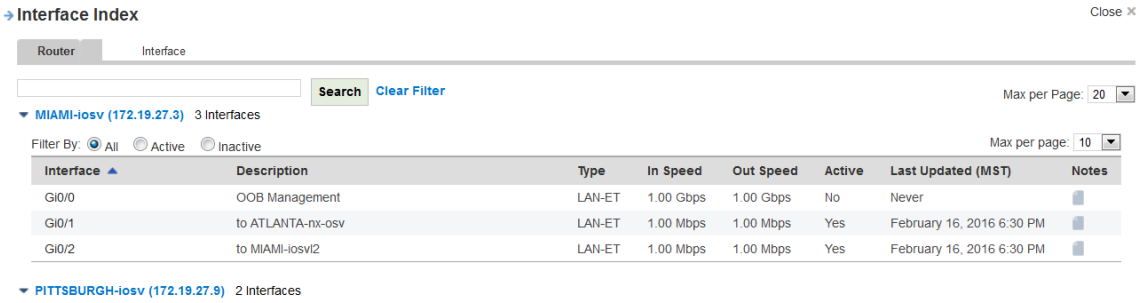


D. Validate Drill-out to NFA - Select “Details Tab” – Click on “Launch NFA diagnostics view” from within Stacked Protocol Graph





E. Validate NFA Access to only Nordole devices and interfaces – Select Change next to current interface to display list of available interfaces and devices.



Troubleshooting

NFA Origin to Interface Group Mapping failing

A. Run the following query to verify origin enrichment has occurred.

```
select distinct source, origin, nim_origin from s_qos_data order by source;
```

Results | Messages

	source	origin	nim_origin
1	ada	forwardinc_hub	forwardinc_hub
2	ada-col-sp	forwardinc_hub	forwardinc_hub
3	ADA-COL-SP-TIX	forwardinc_hub	forwardinc_hub
4	ADA-COL-TIX-QA	forwardinc_hub	forwardinc_hub
5	ATLANTA-nx-osv	forwardinc_hub	forwardinc_hub
6	AUSTIN-nx-osv	forwardinc_hub	forwardinc_hub
7	BOSTON-nx-osv	forwardinc_hub	forwardinc_hub
8	DALLAS-csr1000v	voonair	forwardinc_hub
9	DENVER-iosv	forwardinc_hub	forwardinc_hub
10	FORT-COLLINS	forwardinc_hub	forwardinc_hub
11	MIAMI-iosv	nordole	forwardinc_hub
12	MIAMI-iosvl2	nordole	forwardinc_hub
13	nordole-tixchange-web.nordole.virl.info	forwardinc_hub	forwardinc_hub
14	nordole-tixchange-ws_db.nordole.virl.info	forwardinc_hub	forwardinc_hub
15	PITTSBURGH-iosv	nordole	forwardinc_hub
16	PITTSBURGH-iosvl2	nordole	forwardinc_hub
17	SANDIEGO-iosvl2	voonair	forwardinc_hub
18	SANDIEGO-iosxrv	voonair	forwardinc_hub
19	uim	forwardinc_hub	forwardinc_hub
20	voonair-tixchange-web.voonair.virl.info	forwardinc_hub	forwardinc_hub
21	voonair-tixchange-ws_db.voonair.virl.info	forwardinc_hub	forwardinc_hub

B. Run the following query to make sure changes are getting through to discovery_server.

```
select * from cm_computer_system where cs_id in (select cs_id from cm_computer_system_attr where cs_attr_value like '%Nordole');
```

100 %

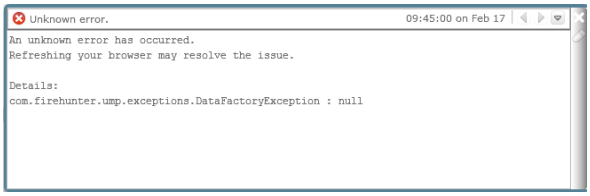
Results | Messages

	date_time	change_time	alive_time	caption	description	dedicated	state	name	domain	origin	ip	dns_na
1	016-02-15 18:43:31.287	2016-02-17 00:00:29.210	2016-02-17 00:00:29.210	NULL	Cisco IOS Software, vios_l2 Software (vios_l2-ADVENT...	SwitchRouter	0	miami-iosvl2	NULL	forwardinc_hub	172.19.25.11	miami-i
2	016-02-15 18:43:34.330	2016-02-16 00:00:30.277	2016-02-17 09:11:29.357	NULL	Cisco IOS Software, IOSv Software (VIOS-ADVENTERP...	SwitchRouter	0	miami-iosv	NULL	forwardinc_hub	172.19.27.3	miami-i
3	016-02-15 18:43:35.553	2016-02-17 00:00:44.153	2016-02-17 00:00:44.153	NULL	Cisco IOS Software, vios_l2 Software (vios_l2-ADVENT...	SwitchRouter	0	pittsburgh-iosvl2	NULL	forwardinc_hub	172.19.25.19	pittsbu
4	016-02-15 18:43:43.740	2016-02-15 19:45:17.787	2016-02-17 09:11:29.330	NULL	Cisco IOS Software, IOSv Software (VIOS-ADVENTERP...	SwitchRouter	0	pittsburgh-iosv	NULL	forwardinc_hub	172.19.27.9	pittsbu

If the changes are not propagating as expected, go back and validate qos_processor changes are occurring (requires log level 3), it is also suggested to restart snmpcollector to facilitate qos_processor changes.

Drillout from UIM to NFA Fails with “Unknown Error”

When drilling out from UIM to NFA and you receive the following error:



This error will be shown when the UIM user is not provisioned in NFA. Please refer back to page 16 for details on completing this process.