

7275 AES-Network Management System (NMS) 5.0

User Manual

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1 Product Overview

The AES-*Network Management System* (NMS) is a complete end-to-end *IntelliNet* Mesh Radio Network monitoring and management platform. NMS provides real-time performance data and an interactive visualization of network service using Google Earth to assure that alarm and other critical signals are communicated quickly and reliably. The NMS platform can also drive down overall network management costs while supporting efficient and profitable network growth as additional *IntelliNet* subscribers are deployed. NMS monitors all network subsystems which includes *MultiNet* servers, IP Links, Burglary and Fire Subscribers and delivers real-time notifications of system events. The NMS software platform was designed with flexibility in mind, providing the ability to add enhancements and new functionality with future releases.



NOTE: Closely follow the entire contents of this User Manual as it contains information that is essential to successfully completing the installation of the AES-*Network Management System* (NMS).

1.1 NMS Product Description

The NMS offers the following features:

- Multi-level Intelligent Network Dashboards
- Radio Network Interactive Visualization of each Business Unit
- 24/7 Notifications via email or SMS of network events to key personnel

1.1.1 Multi-level Intelligent Network Dashboards

NMS features multi-level browser based dashboard architecture for system configuration, maintenance, and operation. The *Administrator Dashboard* is designed for the *MultiNet* owner and provides real time status of *MultiNet* connectivity and the NMS server once the system is set up and operating. Through the *Administrator Dashboard*, the *MultiNet* owner sets up and supports:

- Configuration of *MultiNet* server parameters
- Configuration of NMS server parameters
- Edit user credentials for access to the Operator Dashboards one for each Business Units
- Edit user credentials for access to the Dealer Dashboards one for each dealer
- Remote software upgrade of NMS server
- Reset to factory defaults for NMS server
- Overall appliance Status

Each *MultiNet* Business Unit is set up with a separate *Operator Dashboard* that provides visibility into radio signal traffic and overall operation. This dashboard displays critical Business Unit information in a dynamic and intuitive format to enable a quick assessment of the network's performance and to quickly identify events that could affect network operation. For example, the *Network Pulse* dynamically tracks key performance indicators including

subscriber Check-Ins and Ack Delays over the most recent ten day period. The *Network Health Score* quantifies overall network operational quality on a scale between 0 - 100. Below is a list of Business Unit specific data displayed in a user-friendly format on the *Operator Dashboard*:

- List of Subscribers needing service
- List of IP Links needing service
- Network performance charts
- Total received packets
- IP Link Load
- List of Top Talking Subscribers
- List of Top Repeater Subscribers
- List of Subscribers with Late Check-Ins
- List of Subscribers with Check-Ins more than once per 24 hrs.
- Subscriber Security Quarantine mode

- List of Subscribers with high number of Hops
- List of Subscribers sending Ack Delay signals
- List of Subscribers sending a NetCon signal
- IP Link Equipment List
- Subscriber Equipment List
- Link for Google Earth for interactive visualization of network
- List of Non AES unit

1.1.2 Interactive Radio Network Visualization

Radio Network Visualization is a feature accessed through the *Operator Dashboards* that presents an interactive geographical layout of the *IntelliNet* network and Non-AES units using Google Earth. It will show Business Unit specific information such as the following:

- Subscriber positions
- Subscriber status
- IP Link positions
- IP Link status
- Most Used Route
- Most Recent Route
- Route and distance information

1.1.3 24/7 Notification

The Notification function enables users to monitor their *IntelliNet* network from anyplace at any time. Through the *Operator Dashboard*, users can configure automatic alerts based on the system-wide *Network Health Score* to send alerts by both SMS and email to key personnel. Triggers can also be set up for alerts due to many types of subsystem fault with any Subscriber or IP Links. The user can create the list of personnel to be notified, define the fault criteria to be reported, and create associations between the alerts and personnel to optimize responses.

- Subscribers requiring service
- IP Links requiring service
- Subscriber utilization
- IP Link utilization
- Non AES unit location

1.2 NMS Server Specifications



Server Appliance Hardware Specifications

Processor	SL-1U-LL6412J-GC-1
Mainboard	MinilTX
Chipset	Intel Pentium SoC
System Memory	1x DDR4 2666MHz SO-DIMM RAM, up to 4GB
Ethernet	Realtek RTL8111E,10/100/1000Mbps, 2x LAN
Storage	4x SATA III
Expansion	1x PCI, 1x Mini PCIe
Cooling System	CPU Fan <2>
Power Supply Form Factor	Standard ATX 20 Pin
Graphic Controller	Supported by CPU
Display Resolution	Supported by CPU
PS/2 Port	1x Keyboard, 1x Mouse
Digital I/O	8bit GPIO header
Rear Panel	USB 2.0 (2), USB 3.2 Gen 1 (2), Audio on IO, LAN (2), Serial Ports 232/422/485 (2)
Front LED/Control	Power LED, HDD LED, Power Button, Reset Button, 2x USB

Features and Options	Short-Depth 1U Chassis
Enclosure Materials	Aluminum
Coating Processes	Powder Coating
Mounting Option	19" Rackmount (1 U Height)
Color	Black
Operating Temperature	0 - 60 °C (32 - 140 °F)
Dimensions	11" x 19.10" x 1.75" D x W x H
Weight	Approx. 2.7 kg (6 lb.)
Power Requirements	DC Power: 12 V DC-in

Server Appliance Software Specifications

Dashboard, Visualization, and Notification applications are implemented over an industry standard Linux environment.

1.3 NMS Software and Hardware Requirements

- Windows client PC for accessing NMS Administrator Dashboard and Google Earth
 - o Google Earth application
 - Internet access for Google Earth during operation
 - o Network Access for NMS Dashboard
 - Internet Browser such as Firefox, Chrome etc.
- NMS Server (Included with NMS)
- NMS Server Ethernet cable (Included with NMS)
- NMS Server AC power cord (Included with NMS)
- Uninterrupted Power Supply
- AES-*MultiNet* Receiver version 467 or later is required. For optimal performance the most current version is recommended. **NOTE:** *MultiNet* Receiver Version 467 will not display NetCon faults.

2 Installation and Configuration

2.1 Installation Preparation

It is recommended to collect all configuration information prior to starting installation to reduce installation time.

2.1.1 NMS Server

Take a note of the NMS factory default addresses as they will be needed when connecting with the NMS Server for the first time:

Default Ethernet Connection 1:

- 1. Default IP: 192.168.1.254
- 2. Default NM: 255.255.255.0
- 3. Default GW: 192.168.1.1
- 4. Default DNS1: 8.8.8.8
- 5. Default DNS2: "blank"

Default Ethernet Connection 2:

- 1. Default IP: 169.254.66.66
- 2. Default NM: 255.255.0.0
- 3. Default GW: 0.0.0.0

The following information will be required for setting up the NMS Server with your preferred settings.

- 1. Private IP address
- 2. Subnet Mask
- 3. Default Gateway
- 4. DNS Server 1
- 5. DNS Server 2 (optional)
- 6. Public IP address (optional)
 - a. TCP port 1194, 1195 for AES VPN

2.1.2 *MultiNet* Receiver

Only one *MultiNet* Receiver can be monitored at a time so identify which *MultiNet* (usually the Primary *MultiNet*) is to be monitored by the NMS and collect the information below.

- 1. MultiNet IP address
- 2. MultiNet password

2.2 Connect and Power up NMS Server

- 1. Connect the power cord to NMS and plug into an outlet, NMS server will power up right away
- 2. Connect NMS Server (Ethernet port labeled 1) to an IP network or PC where it can be reached with the factory IP address (192.168.1.254) from a PC for configuration purposes

2.3 Access the Administrator Dashboard

- 1. Open a web browser on a PC on the same network as NMS server
- 2. Enter the default IP address: https://192.168.1.254 in the browser URL
- 3. This will open the Administrator log on Window
- 4. Login as administrator type "admin" in Business Unit and use the password "admin"

NOTE: Password can be changed later

2.3.1 Enter Contact Information

- 1. Click on Maintenance
- 2. Then **Contact**
- 3. Enter contact information
- 4. Click Save

2.3.2 Configure the NMS Server IP settings

- In the Administrator Dashboard click on Configuration>NMS Server to change the NMS IP settings.
- 2. Change the NMS IP settings to the prefered network settings on the same network as *MultiNet*
- 3. Click OK.
- 4. Power down the NMS server by briefly pushing and releasing the power button. The NMS will power down within 10 seconds.

2.3.3 Enter *MultiNet* Receiver parameters

- 1. Disconnect NMS sever from the initial network if not the same IP network as the MultiNet receiver.
- 2. Move the server to the permanent rack location use the rack mount brackets included
- 3. Connect server to same IP network as *MultiNet* receiver (Ethernet port labeled 1)
- 4. Access the Admin Dashboard enter https://new NMS IP address and log in as before as administrator.
- 5. Click on **Configuration**>*MultiNet* Receiver.
- 6. Enter the MultiNet receiver IP Address and password
- 7. Click Connect to Primary MN and NMS will restart and begin communication with MultiNet
- 8. If preferred you can also configure the Secondary receiver when the NMS reboots.

COR	PORATION	Managemen System
Business L	Init.	
Password		
	Sign in	

Contact Information	
Company Name:	
Email Address:	
Company Phone:	
	Save

NMS Administrator Status	Configuration - Maintenance - Business Units	
	MMS Server MultiNet Receiver tion NMS Server Estemal Name	
	NMS Server Private IP Settings IP Address	
	192 168 1 244	
	Subnet Mask	
	255 255 255 0	
	Default Gateway	
	192.168.1.1	
	DNS Server 1	
	8888	
	DNS Server 2	
	Optional	
		OK Cancel

NMS Server IP Settings

Primary MN IP Address		
10.0.6.243		
Primary MN Password		
	Connect to Primary MN Cancel	
Secondary MultiNet Receiver (Optional)		
Secondary MN IP Address		
Secondary MN Password		

MultiNet Receiver Parameters

2.3.4 Verify that the NMS is communicating with the *MultiNet* receiver

- 1. After the NMS server restarts, access the *Administrator Dashboard* by entering the new IP address *https://new NMS IP address*.
- 2. Within a few minutes verify that you see the number of Business Units monitored at the top of the *Status screen*. The number might change as information is retrieved from the *MultiNet*. This could take between 15 minutes and a few hours depending upon the size of the database.

Note that *MultiNet* operation is never affected in any way by the operation of NMS.

	Network Manager System	ment					
NMS Administrator	Status.	Configuration +	Mainténance +	Basiness Units	нер		
						Monitoring 7 I	Business Units
			Daemons				
						Database Reorganization:	Running
						Dashboard	Running
						Address File Import	Running
						Geocoding.	Running
						Notification:	Running
			Connectivity	/			
						MultiNet Receiver.	Connected
						Geocoding Server.	Connected
						Mail Server;	Connected
						MPN:	Connected (Appliance IP address: 172 17.0.56)

Administrator Dashboard Status screen - Verify number of Business Units monitored.

The AES-*Network Management System* is now ready for operation. The next sections provide additional information and operational instructions.

3 System Operation Summary

NMS features multi-level browser based dashboard architecture for system configuration, management, and operation. The *Administrator Dashboard* is designed for the *MultiNet* receiver owner. The *Operator Dashboard* is designed for each Business Unit (one user per Business Unit). The Administrator and the Operator Dashboards can both be accessed at <u>http://your NMS IP Addess</u> but they have different capabilities and different login credentials. Below are some capabilities of the *Administrator* and *Operator Dashboards*.

Administrator Dashboard - Monitoring and Configuration Capabilities:

- NMS system and MultiNet connectivity status
- NMS private and public IP settings
- Settings for communication with MultiNet
- NMS factory reset and restart
- NMS software upgrade
- User credential configuration
- Dealer configuration

Operator Dashboard Monitoring Capabilities:

- Network Health Score
- Subscriber and IP Link service requirements
- Network Pulse
- IP Link load
- List IP Link Service Log
- List Top Talker Subscribers
- List Top Repeater Subscribers
- List Late Check-In Subscribers
- List Frequent Check-In subscribers
- List Subscriber Service Log
- Subscriber Security Quarantine mode
- List Subscribers with 4 or more Hops
- List Subscribers with Ack Delays

Dealer Dashboard Monitoring Capabilities:

- Network Health Score
- List Non-AES units
- List IP Link Service Log
- List Subscriber Service Log
- Dashboard custom logo

- List Subscribers with NetCon trouble
- List of IP Links and Subscribers with model and revision numbers
- Subscriber and IP Link addresses import for Google Earth
- Google Earth access
- Set up 24/7 Notifications or network events
- Operator password change
- List Non-AES units
- List of Inactive Subscribers
- Dashboard custom logo
- List of NCT units

4 Administrator Dashboard

4.1 Login

If you are a *MultiNet* Owner, you can access your *Administrator Dashboard* by signing in at the following URL: <u>http://your_NMS_IP_address</u> to launch the sign in screen. The username will be "admin" and the password "admin". **NOTE**: Password can be changed later.

Business Unit		
Password		
	Sign in	

4.2 Administrator Dashboard - Status

The *Administrator Dashboard* displays the status of the *MultiNet* receiver and the NMS server as detailed in the screen below followed by an explanation of each of the sections on the status screen. Click on **Status** to return to the Status screen.

	Network Managem System	nt
NMS Administrator	😭 Status	♦ Configuration • F Maintenance • # Business Units # Dealers 0 Help
		Monitoring 2 Business Units
		Daemons
1		Database Reorganization: Running
		Dashboard Running
		Address File Import Running
		Geocoding: Running
		Notification: Running
		Remote Subscriber Access Service Ranning
		Remote Keypad and Compass Access Service: Running
		Connectivity
		MultiNet Receiver Connected to Primary (10.0.9.4)
1		Geocoding Server: Connected
		Mail Server, Connected
		VPN. Connected (Appliance IP address. 172.17.2.172)

Administrator Dashboard - Status Screen

Database Reorganization

Indicates proper optimization of databases and gathering of data from the MultiNet receiver and reorganizing in NMS

Dashboard

Indicates that Dashboard calculations and preparation of data for presentation on the Dashboards are operating properly

Address File Import

Indicates status of importing addresses from a .csv file in to the NMS

Geocoding

Indicates status of geocoding when finding GPS coordinates for the provided addresses

Notification

Indicates status of Notification function - NMS monitoring for trigger conditions configured by users

Remote Subscriber Access Service

Indicates status of feature used to access the subscribers remotely

Remote Keypad and Compass Access Service

Indicates status of service used to access (1) Virtual keypad through subscribers and (2) Used to connect remotely via Compass

MultiNet Receiver

Indicates connectivity to the *MultiNet* receiver

Geocoding Server

Indicates connectivity to the Geocoding server

Mail Server

Indicates connectivity to the Mail server

VPN

VPN for remote support from AES Tech Support team and remote system upgrade

4.3 NMS Server Configuration

The view below will be displayed after clicking on **Configuration** then selecting **NMS Server**. This allows you to enter and change NMS private IP setting.

Configuration>NMS	Wetwork Management System	
Server	NMS Administrator II: Status O Configuration - F Maintenance - III Dosness Units III Dealers O Help	
Enter NMS server IP settings and click OK	Configuration NMS Server NMS Server Private IP Settings IP Address 100.0172	•
Select Preferred Connection Type and Click Submit	Subert Mask 255 259 0 0 Default Cateway 10 0 17	
Select Google Earth Login preference if you'd like to	DKS Server 1 6.8.8 DKS Server 2 Costonal OK Cancel	
enable or disable Google Earth login request.	Preferred Connection Type O HTTPS (443) * HTTP (80) Google Earth Logen & Subme	1

Configure NMS Server Screen

4.3.1 MultiNet Receiver Configuration

The view below will be displayed after clicking on **Configuration** then selecting *MultiNet* Receiver. This allows you to change *MultiNet* Receiver settings.

Configuration>MultiNet Receiver	NMS Administrator If Status © Configuration # Mansanana - III Dualwas Diess III Dualwas Ø Help		
Enter Secondary <i>MultiNet</i> IP address and password and click Save Secondary MN	Configuration MultiNet Receivers . Connected Receiver: Primary MultiNet (10.0.9.4) Primary MultiNet Receiver Primary Mit IP Address 10.9.4 Primary Mit Passaord		+
Enter Primary <i>MultiNet</i> IP address and password and click Connect to Primary MN	Connect to Secondary MultiNet Receiver (Optional) Secondary MN IP Address 108.9.6 Secondary MN Password Serve Sec	hrmany AN Cancel	

NOTE: Entering a new IP address after initial setup will result in loss of current data in the system including address and GPS data.

4.3.2 External Name Configuration

The view below will be displayed after clicking on **Configuration** then selecting **External Name**. This allows you to change NMS public IP settings for communication from outside the LAN.

Configuration>External Name

Enter a public IP address or host name and port number if needed for access from outside the LAN

Enter UDP port number for Subscriber Remote Programming

Enter TCP/IP port number for Compass 2.0 programming

AES	Network Managemen System	it i							
NMS Administrator	11 States	O Configuration+	F Mactionaria -	II Domesia Unite	III Domon	O Hulp			
			Cor	figuration Extern	al Name				
			NMS	Server Public IP S	ettings				
				Address or Hostparn					
			ь	teenal TCPRP Port No	mber for Goog	ple and Dashboard (1 - 65535) Optimal		
			Б	iternal UDP Port Num 1200	ber for Subscri	ber Remote Program	ming (1200 - 65535)		
			Б	ternal TCP/IP Port No 1300	mber for Com	pass 2.0 (1200 - 655)	5)		
							ОК	Carcel	

4.4 Maintenance - Administrator Dashboard

The view below will be displayed after clicking on **Maintenance** then selecting **System**. This allows you to do the following:

- 1. Restart the NMS server when you click on **Restart** the NMS system will restart. If the NMS server is restarted, contact information, and NMS server IP settings will not be affected.
- 2. Upgrade NMS software using an upgrade package or URL. The new upgrade package and passphrase will be provided by AES. Upgrading the NMS software will cause a restart to the NMS appliance.
- 3. Reset NMS to Factory Default State this will reset the system to original status. All passwords will be reset to default and all Business Unit data will be lost. The NMS private IP address and customer contact information will not be lost.

INCOME ADDRESS OF THE CONTRACTOR OF THE OWNER OWNE	INTERNATION CONTRACTOR CONTRACTOR							
THE FULL AND A STATE OF A STATE O								
	System							
Mainte	Passworth							
In the other	Control							
	License							
Restan	(NMS Server							
	Restart							
Upgrad	te NMS Server Software							
Current	Software Version: 0.10.2058							
Up	vgrade Package							
6								
	Upload trem local or network drive							
	Retrieve from remote HTTP or FTP site							
Fil								
	30x20							
Pa	tenhras							
	Upgrade							
Pesel 1	NU/S Server to Eactory Default State							
here i	and date to a number of an and							
	E an Dear							
	P actory Hesset							

System Section

4.4.1 **Passwords**

The view below will be displayed after clicking on Maintenance then selecting Password. This allows you to set and/or change the Administrator Dashboard password as well as the Operator Dashboard passwords for all Business Units. The factory default log in and password for access to the Operator Dashboard at start up is admin (enter into Business Unit field) and admin for password.

Maintenance>Password	Menagement		
	NMS Administrator Status Configuration- Membriance- Bearvers Union		
Select either administrator or a	Maintanance Descurede		
Business Unit	User NAXS, Administration of Business (Jing		
	NAIS Administrator	•	
Enter current Admin password	NMX Administrator Password		
	New Password		
Enter new password twice	1-32 characters - sitting, digits, or any of the following: 1 (Q # \$ 5 % **()) Descented.		
	Continu		
Click OK to save	OK Casol		
	Password Section		

4.4.2 **Contact Section**

The view below will be displayed after clicking on Maintenance then selecting Contact. This screen allows the MultiNet owners to input contact information. The contact section is not affected by a system restart.

Maintenance>Contact

Enter Administrator contact information including email and phone

Click Save

COMPONENCIA	System	inerrit.					
MS Administrator	Skin	Donlguntter-	Maniscretch +	Bitteen) Units			
		Maintenanc	e Contact				
		Contact In	formation				
					Company Name	Marsel Kase	
					Ernal Address.	Industry (page to be industry (your	
					Company Phone	8002376367	
					54	**	
		AES Corpora	ne Vilabsite				
		100100-000					
		AES Contect	information				
		1999 Bes 100	ann (ranna)				
		AFS Technic	al Rumond				

Contact Section

4.4.3 SSL Certificate

The view below will be displayed after clicking on **Maintenance** then selecting **SSL Certificate**. This feature helps you create and SSL CSR using Apache ModSSL. Enter all the relevant information asked for in the form on this page and click on Create CSR to generate a SSL certificate.

ARES Network Management System		
NMS Administrator 🕄 Status O Configuration- 🖈 h	kinimance- III Baseven Unitz III Dealers O Halp	
	Maintenance SSL Certificate	
	Create SSL CSR using Apache ModSSL (SSL Certificate Signing Request)	-
	Country Name (2 letter code):	
	State or Province Name (full name):	
	Locality Name (og. city):	
	Organization Name (eg. company):	
	Organization Unit Name (eg. department or section - Optional):	
	Common Name (eg. server FQDN or YOUR name):	
	Email Address (Optional):	
	Create CSR	

SSL Certificate Section

If you prefer, you can install your own key and SSL certificate at the bottom of the page.

Upload and install SSL Certificate		-
Certificate File (.crt format only) Choose File No file chosen SSL key file (if needed) Choose File No file chosen	Upload	

Upload and Install SSL Certification

4.5 **Business Units**

If you are the *MultiNet* owner and have access to the *Administrator Dashboard*, you can access the *Operator Dashboard* for any Business Unit by clicking on **Business Units** then click on any Business Unit listed. This will launch the *Operator Dashboard* for that Business Unit in a separate tab. The *Administrator Dashboard* remains open. The Administrator can open multiple Business Unit *Operator Dashboards*. This window also provides information about the version number of the *MultiNet* to which the NMS is connected. You can also access the *MultiNet* GUI page from NMS. Click on Login to MN Admin and enter the username and password of MN to get access to MN GUI.

CORPORATION Network Management System		
NMS Administrator # Status Configuration-	antenance - # Doamesa Units III Dealers 0 Halp	
	2 Business Linits	
	801 102	
	MutiNet Version	
	1.15.104.3387	
	MultiNel Admin GUI	
	D Login to MN Admin	

Business Units Section

4.6 Dealers

The view below will be displayed after clicking on **Dealers** for the first time. This allows you add new and maintain existing Dealers. You can change password for the dealer, select which Business unit they can have access to, also select whether they can have access to Virtual keypad Remote Access and/or Compass Programming Remote Access.

You can also choose whether you want to show Route information and Statistic on a Subscriber Unit View for a certain dealer.

You can also choose whether you want to show subscribers on Google Earth that belong to other dealers for each specific dealer.

AES Administrator II Status O Configuration	- 🖌 Maintensance - 📲 Business Units 🗐 Dealers 🛛 Help	
	Add Dasler	
	New Dealer Username (Characters and Digits only)	
	New Dealer Osemaine	
	Dealer Account # (Optional)	
	New Dealer Password (8-32 characters at least one uppercase letter and digit or any of the following: 1 (8 # 5 % ^ * ())	
	Plasword	
	Control	
	Select Business Unit	
	Please Select	
	Virtural Keypad Remote Access	
	Compass Programming Remote Access	
	Show Route Information and Statistics	
	and out dealers a supplement of doogle can do discussion them	
	Upload Subscriber CSV File (Uplichal, hexadeomial subscriber (Us only) Choose File (No file chosen	
	autore and the methods.	

After you add a Dealer you will see thes following when you click on Dealers

	Network Manageme System	nt									
NMS Administrator	😭 Status	Configuration -	📕 Maintenance 🗸	Business Units	III Dealer	s 🛛 Help					
				Dealers							
				Dealer UserNar	ne 🔺	Dealer Account #	•	Number of Subscribers	Number of IP Links	NMS Access	٥
				Dealer12		das		1	1	BU1	Î
				Dealer123		dsad		t	0	BU1, Keypad, Compass, Routes	Î
				Add/Edit Dealer							
				Add Dealer	ler © E	dit Dealer	ordy)				
				New Deale	r Useman	e	outry/				
				Dealer Acco	unt#(Op	tional).					
				New Dealer	Password	(8-32 characters at lea	ist one	e uppercase letter and digit or any of	the following: I @ # \$ % ^ * ())	
				Password							
				Confirm							
				Select Busin	iess Unit						
				Please Se	lect						्र
				 Virtural I Compas Show Ro 	Keypad Re s Program oute Inform	mote Access ming Remote Access nation and Statistics					
				Upload Sub Choose File	scriber CS	's equipment on Goog V File (Optional, hexad hosen	le Eal	th Utilization View			
								UK Can	Cei		

Once the dealer is created, you can click on dealer username to access the Dealer Dashboard. You can also click on the number below the *Number of Subscriber and Numbers of IP Link* and select the list of subscribers and/or IP Links which you want to add/delete to that dealer.

4.7 Help - Administrator Dashboard

Through the help tab on the *Administrator Dashboard*, users can easily access additional information for help, such as manual, FAQ and videos.

	Network Manageme System	nt					
NMS Administra	ator 1 Status	Configuration-	✗ Maintenance -	Business Units	III Dealers	0 Help	
	Documents						
	User Manual						
	Frequently Asked C	Questions					
	Videos						
	AES YouTube Char	nnel					
	AES Technical Sup	port					
	www.aes-intellinet.	com/contact-us/techni	cal-support				

4.8 Web API

The NMS has a Web API which allows users to add, remote or update subscriber information form a program or other device without having to log into the GUI.

The form looks similar to the example below: <u>https://nms_server_ip/nmsapi.html?request=url_encoded_json_string</u> Note that API item names are low cases

request string format {"name":"value", "name2":"value2",}

For Example:

{"pwd":"admin", "bu":"BU1", "dealer":"Dealer1", "action": "add", "subid":"1234", "address":"310 Main St"} {"pwd":"admin", "bu":"BU1", "dealer":"Dealer12", "action": "add", "subid":"23F0"}

API requests must be contain: **pwd** --> admin user's password **bu** --> Business Unit name (case sensitive) **subid** --> Subscriber ID (aes hex number)

If you include the **dealer**, then you must provide action too. **dealer** --> dealer name **action** --> add, delete or update (all low cases)

All of the fields below are optional: address --> subscriber geography address address2 city state zip country latitude --> for example 40.7486 longitude --> for example -77.8786

5 Operator Dashboard

5.1 **Overview**

The Operator Dashboard displays all information available from the MultiNet receiver for that Business Unit for the last 10 days. Each Operator Dashboard provides the following important information to the operator to help manage, monitor, and maintain the AES-IntelliNet network.

5.2 Login

If you are a Business Unit Owner, you can access your Operator Dashboard by signing in at the following URL: http://your_NMS_IP_address to launch the sign on screen below. The username will be the MultiNet Business Unit name and the initial password is "oper". Each Business Unit has its own username but the password is the same for all Business Units, "oper". This can be changed after login. Business Unit users should coordinate Operator Dashboard password management with the MultiNet owner.

	Business Unit Sign on Screen
Enter name of Business Unit	CORPORATION IntelliNet
Password (default password	Business Unit
is "oper")	Password
	Sign in
	a second s

Ducinoca Unit Sign on Son

5.3 **IP Link and Subscriber Status Monitoring**

If IP Link and Subscriber faults occur, these faults are highlighted on the left and right panels of the Dashboard to indicate new service requirements in real time do that they can be scheduled in the normal workflow. The green color indicates that there are no faults with any Subscribers or IP Links.



5.3.1 **IP Link Status Monitoring**

New IP Link faults will flash red-white for 10 seconds then remain red. These faults can flash again red-white when the browser is refreshed but if you click on any of the faults to view them, they will remain red.

5.3.2 **Subscriber Status Monitoring**

New Subscriber faults will flash orange-white for 10 seconds then stay orange. If a new Subscriber is added to a fault, the fault will flash red-white for 10 seconds then remain red.

View Fault Detail Windows 5.3.3

Each fault is described by name and in parentheses next to the name is the number of IP Links or Subscribers on the network experiencing that fault. To view a list of IP Link or Subscribers with the fault, click on the red button for

that fault to open a Fault Detail Window. An example is below - a list of Subscribers with a low battery fault condition.

To access Fault Detail Window, Click on a fault. This is an example of Subscriber Battery Fault Detail Window - on right.

The IP Link and Subscriber fault detail windows privide the following:

- Name of the fault and Event code _
- A description of the fault and what causes it
- Tips for resolving this fault
- Total number of IP Links or Subscribers experiencing this fault
- Sortable list of IP Links or Subscribers experiencing this fault and the time stamp

Filters at the top of each column permit easy search and sort of the contents of the column.

Subscriber batter network performa Tips Ensure that the b	/ voitag nce attery is	e has dropped, or the battery has	s been disc Clic	k h coi	ere to antents of	au of	tomat any co	ic 51	cally sor umn	t	
The battery may	used bo	be replaced		1							
10 Subscriber	s are	currently reporting this Fa	ut								
Subscriber ID	0	Fault Time	✓ Address 1	•	Address 2	•	City	•	State	0	ZIP
0710		10/29/2014 9/34/07 AM	43 Main Street				Pushidu		Massarhunatta		01960
0804		10/29/2014 8 27 29 AM	42 West Baltimore Street				Lynn		Massachusetts		01902
9645		10 29/2014, 7 58 22 AM	17 Devonshire Road				Middleton		Massachusetts		01949
		0/29/2014, 7 45 12 AM	11 Dartmouth Street				Malden		Massachusetts		02148
1032		10/29/2014, 6:46:09 AM	32 Raynor Circle				Boston.		Massachusetts		02120
1032							-		Managehungths		01923
1032 6603 0968		10/29/2014, 6-44-50 AM	20 Abington Road				Danvers		TYND DODLEDA DELLO		
1032 6603 0968 9682	1	10/29/2014, 6-44-50 AM 10/29/2014, 4-22-26 AM	20 Abington Road 5 Jacobs Landing				Danvers		Massachusetts		01923
1032 6603 0968 9682 9683	/	10/29/2014, 6.44.50 AM 10/29/2014, 4.22.26 AM 10/29/2014, 2:40:03 AM	20 Abington Road 5 Jacobs Landing 107 Mills Avenue				Danvers Danvers Revere		Massachusetts Massachusetts		01923

Next, One-click detail information is available for any specific Subscriber. Click on and Subscriber ID to open the Subscriber Detail Window that provides:

- Type of Subscriber model and revision _
- Location including address and longitude and latitude
- Current faults if any including CID codes
- Routes and time stamps _
- Peers and time stamps _
- Number of repeat dependent Subscribers
- Number of generated messages over last 10 _ days
- Subscriber Programmed Settings
- 10 day event history including CID codes. _

One-click detail information is also available for any specific IP Link.

	Sı	Ibscriber ID: 5112
Version C		
	Model:	7450/7440
	Revision:	2.41
Location		
	Address 1:	501 Brookside Drive
	Address 2:	
	City:	Andover
	State/Province:	Massachusetts
	Zip/Postal Code:	01810
	Country:	United States
	Latitude:	42.6861397
	Longitude:	-71.1968995
	Elevation:	2
Current Faults	C	
Event Code 🔺	Name 🗘 Time	
4		
F807 00 C801	Battery Tuesda	y, April 21, 2015 10:03:05 AM

Subscriber Detail Window

Click here to search and sort current faults

5.4 Network Health Score

The Network Health Score is a quick indicator of network performance. The score is calculated based on the number of Ack Delays, IP Link and Subscriber faults as well as the number of late check-in messages. The Health Score range is a number from 1 to 100. A higher score suggests a healthy network and a lower score suggests that improvements can be made to the network.

CORPORATION Network Management System	
IBA Dashboard Equipment+ Geography+ Notification+ Maintenance+	Sign out
Monitoring 5 Network Health Score	IP Links and 1470 Subscribers
Total RF signals	97 eceived by IP Links in last 24 hours: 6,031
Network Health Score	
Description	Click on the Network Health Score bar to view more
The Network Health Score measures overall Network Health as a rating from 1 (poor) to 100 (excellent). The calculation is based on several parameters, including active IP Link and Subscriber Faults, late Check-ins, and Ack Delays.	details about the Subscribers and IP Links that are affecting your Network Score.
0 IP Links at Fault	
6 Subscribers at Fault (- 1 Point)	
0855 0975 0936 2183 3351 4100	
1 Subscriber with Late Check-in (- 1 Point)	
4076	
16 Subscribers with Ack Delay (- 1 Point)	
0062 0210 0251 0305 0465 0743 0894 0936 0963 1439 1518 2183 3042 3804 3870 4090	

5.5 Total Signals Received

"Total signals received in the last 24 hours" indicates how much inbound RF traffic has been received in the last 24 hours. This includes all events that originate from the AES Subscribers and also the alarm panels.

Click on the "Total signals received in the last 24 hours" to see additional details about the amount of traffic from all IP Links in the Business Unit.

Total signals received in the last 24 hours: 16,732



5.6 Network Pulse

The Network Pulse is a dynamic 10 day historical view of leading network health indicators. Network Pulse at the Dashboard level presents the number of Check-Ins and Ack Delays in a way such that any change in network performance will be quickly visible. A consistent pattern to the Network Pulse indicates consistent network operation. If an issue develops with network performance, the number of Check-Ins will decrease and the number of Ack Delays will increase. This change in performance will be quickly visible because the 10 day pattern will change. Additional one-click detail is available by clicking on the **Network Pulse** Chart which will open a window with a 10 day history of <u>all</u> events.

Network Pulse - Dashboard view

Blue line section details 10 day history of all Subscriber Check-Ins

Red line section details 10 day history of all Subscriber Ack Delays Click on the chart to open detail view window of all events



Detail View shows a 10 day history of all events depending on check boxes at top. Includes:

- RF Check-Ins
- IP Check-ins
- Ack Delays
- All events
- Self-test failure
- General alarm
- Fire trouble
- Alarm Panel Events on Line card 3 (RF)
- Alarm Panel Events on Line card 4 (RF)
- Alarm Panel Events on Line card 5 (IP)
- Alarm Panel Events on Line card 6 (IP)



Network Pulse Dashboard View



Network Pulse Detail View

5.7 Network Analysis Tools

Under the Network Pulse are a set of Network Analysis tools for 3 critical network subsystem categories - IP Links, Subscribers and Mesh. Clicking down on each link opens another window which provides analytical information related to network performance. Note that these windows update automatically.



IntelliNet Network Analysis Tools

5.7.1 IP Links Load

Click down here to see a 10 day history of total signals and relative distribution across IP Links on the network. An example of the IP Link Load is illustrated below. Ideally, all IP Links in the network should handle roughly equal volumes of RF traffic. This generalization does not apply when the antennas of two IP Links are deliberately placed within RF range of each other such as at a Central Monitoring Station. See the Tips section describing how to increase RF traffic handled by an under-utilized IP Link.

Click on **Load** to open new window with the following information relating to the IP Links on the network:

- A description of IP Links load concept
- A number of tips are offered to generally improve network performance
- A list of the IP Links is presented at the bottom
- Additional analytical details including number of packets received by each IP Link and the distribution of packets among all of the IP Links on the network

Filters at the top of each column permit easy search and sort of the contents of the column.

Description		Click here	a to automatical	ly sort
Ideally, all IP Links in does not apply when example, at a Centra under-utilized IP Link	n the network sho the antennas of t Il Monitoring Stations	uld conter	nts of any colur	nn
Enter tex search co	t here to au ontents of a	utomatically any column		
wove the IP Link to a	a location where	nore RF trainc is expected.	Ň	\backslash
Move the IP Link ant	enna to a higher	position.		\
	/			
1010000000000			4 00-00-00	
IP Link inbound	packer distribu	ution over the period 10)d 00:00:00	
IP Link inbound	packer distribu \$ P	ution over the period 10 Packets +	0d 00:00:00 Distribution	
IP Link inbound IP Link ID	packer distribu	ution over the period 10 Packets +	Dd 00:00:00 Distribution	*
IP Link inbound IP Link ID 8844	packer distribu	ution over the period 10 Packets • 43312	Dd 00:00:00	43.62%
IP Link inbound IP Link ID 8844 8833	packer distribu	vition over the period 10 Packets • 43312 28719	Dd 00:00:00	43.62% 28.92%
IP Link inbound IP Link ID BB44 BB33 BB66	packer distribu	ution over the period 10 Packets • 43312 28719 22089	Distribution	¢ 43.62% 28.92% 22.24%
IP Link inbound IP Link ID 8844 8833 8866 8888	packe distribu	ution over the period 10 Packets • 43312 28719 22089 5181	Distribution	43.62% 28.92% 22.24% 5.22%

IP Link Load

Next, One-click detail information is available for any specific IP Link. Click on any IP Link ID to open the **IP Link Detail Window** that provides:

- Version of IP Link model and revision
- Location including address and longitude and latitude
- Current faults if any including CID codes
- Number of repeat dependent Subscribers
- Number of generated messages over last 10 days
- A section for Notes
- 10 day event history

Version		
	Model	7170
	Revision	\$1.6.23X
Location		
	Address 1	303 Highland Avenue
	Address 2	
	City	Salem
	State	Massachusetts
	ZIP	01970
	Country	United States
	Latitude	42.501296
	Longitude	-70.923871
	Attitude:	
Current Faults		
(none)		
10-Day Totals		
	Repeat-dependent Subscribers:	1391
	Generated Messages	0
Notes		
10-Day Event History		

IP Link Detail View

5.7.2 IP Link Service Log

Click here for a list of all IP Links which may require service. This window will give you quick information about what kind of Fault the IP Link is experiencing and its location. You can also click on the IP Link ID and this will open the IP Link Detailed window as explained before.

	-		IP	Ľ	ink Servi	ce Lo	g			
-	AES Artol Abr									e
Des	cription									
Occa	sionally IP Links	may re	quire service	e ar	nd this log iden	tifies all o	f the I	P Links that are	in need of Ser	vice.
Tips										
Use t	the smart filters b	elow to	filter base	d or	address, zip,	type of se	rvice	etc.		
You	can also use mult	iple filt	ers, based	on t	he zip and type	e of fault f	or exa	ample.		
1 IP	Link Requires S	Service	e					Fault Event, A	Address 1, Add	•
ID ¢	Fault Event	*	Address 1	•	Address 2	City \$	Stat	e/Province 💲	Zip/Postal Code	**
	TOPHE									

5.7.3 Top Talkers

Click down here for a list of all Subscribers that have sent any signal other than Check-In during last 10 days. For each of these Subscribers, this list also includes total signals transmitted, the events most sent, and the number of times this event was sent.

Click on **Top Talkers** to open a new window with the following information relating the Subscribers on the network:

- A description of the Top Talker Concept
- Tips for generally improving network performance.
- A list of the Subscribers that generated the largest amounts of events in the last 10 days.
- The total number of events generated by each of these Subscribers
- The most used Event Code and the most used Event Code occurrence total

Filters at the top of each column permit easy search and sort of the contents of the column.

Click on any Subscriber ID to open **Subscriber Detail Window**

One-click detail information is available for any specific Subscriber. Click on and Subscriber ID to open the **Subscriber Detail Window** that provides:

- Type of Subscriber model and revision
- Location including address and longitude and latitude
- Current faults if any including CID codes
- Most Recent Route
- Most Used Route
- Number of repeat dependent Subscribers
- Number of generated messages over last 10 days
- Subscriber Programmed Settings
- 10 day event history including CID codes

Description Ideally, all Subscribers consuming air time. The	in the networ Tips below	k should generate rou describe how to reduc	ghly equal numbers e excess activity on	Click here content	to ts	automatically sort of any column	
Tips							
Ensure that the Subscri	ber is installe	ed property.					
Ensure that the Subscri	ber is free of	faults.					
Ensure that the Alarm F	anel connect	ted to the Subscriber is	s configured and connect	ed property.			
Ensure that the Alarm P	anel connect	ted to the Subscriber i	s free of faults.			\backslash	
Ensure that all zone, po	iver, and con	mmunication wires are	secured property				
785 Subscribers h	ave genera	ated events other	than Check-ins in t	ne last 10 days.			7
Subscriber ID	•	Events 👻	Most-used Event Cod	e	•	Most-used Event Total	
9795	T	6998	E140 00 C004				490
7942		2020	E140 00 C012				134
1007	1	1536	E140 00 C003				96
682	-						59
791 Ente	er text	here to au	utomatically	y			46
seat	ch co	ntents of a	any colum				56
677							13
6882		242	E370 00 C002				12

Top Talkers - Subscribers

	Subscriber ID:	9739	
Version			
		Model	7450/7440
		Revision	2.50
Location			
		Address 1	43 Main Street
		Address 2:	
		City:	Peabody
		State	Massachusetts
		ZIP	01960
		Country:	United States
		Latitude	42.524565
		Longitude	-70 9253839
		Altitude	
Current Faults			
Event Code	▲ Name	;	¢ Time
P307 00 C801	Battery		10/29/2014, 9:34:07 AM
Most Recent Route			
		Hops	1
		Route:	9739-+bb33
		Time	10/29/2014, 9:34:07 AM
Most Used Route			
		Route.	9739 → 5644
			the second se

Subscriber Detail View

5.7.4 Top Repeaters

Click here for a list of the top 5% largest repeater Subscribers. Repeating the packets of other Subscribers is a normal function of the mesh network. Excessive packet forwarding by a single Subscriber may reduce network efficiency and cause delays though it is unlikely. It may be advisable to locate or install an additional IP Link near Subscribers forwarding RF packets from a high percentage of other Subscribers.

Click on **Top Repeaters** to open a new window with the following information relating the Subscribers on the network:

- A description of the Top Repeater Concept

		Top Repeating St	ubsc	cribers	r#
Description					
It is normal for some Su packets along their rout reduce network efficien	ubscribers to r te toward an If cy and cause	epeat RF packets originating f P Link. However, excessive pa delays.	rom oth icket re	ner Subscribers, to convey t petition by a single Subscril	hose ber may
Tips					
Install an IP Link near a	any Subscriber	r repeating packets for many d	lepende	ent Subscribers.	
Consider changing the	antenna heigh	nt or replacing with a higher or	lower g	gain antenna.	
Consider changing the Repeaters servicin days Subscriber ID	antenna heigt ng greatest ≎	nt or replacing with a higher or numbers of repeat-dep	lower g ender	jain antenna. nt Subscribers in last Last 24 hours	10
Consider changing the Repeaters servicir days Subscriber ID	antenna heigt ng greatest ≎	tt or replacing with a higher or numbers of repeat-dep	lower g ender	nt Subscribers in last	10
Consider changing the Repeaters servicir days Subscriber ID	antenna heigt ng greatest ≎	tt or replacing with a higher or numbers of repeat-dep	lower g eender	uni antenna. Int Subscribers in last Last 24 hours 55	10
Consider changing the Repeaters servicin days Subscriber ID 0054 0329	antenna heigt	Last 10 days 178 170	lower (Last 24 hours 55 95	10
Consider changing the Repeaters servicin days Subscriber ID 0054 0329 0138	antenna heigt	Last 10 days 178 170 142	vender	Last 24 hours 55 95 51	10
Consider changing the Repeaters servicin days Subscriber ID 0054 0329 0138 0311	antenna heigt	Last 10 days 178 178 170 142 139		Last 24 hours 55 95 51 59	10

Top Repeating Subscribers

5.7.5 Late Check-Ins

Click here for list of Subscribers from which the *MultiNet* Receiver has not received a Check-In message at the expected time (as configured on the *MultiNet* receiver). This could indicate a service requirements for this Subscriber or may be explained by some environmental factor such as the weather. In order to come off this list, the Subscriber must transmit 3 Check-Ins on schedule.

Click on **Late Check-Ins** to open a new window with the following information relating the Subscribers on the network:

- A description of the Late Check-In Concept
- Tips for generally improving network performance.
- A list of the Subscribers that currently are late to Check-In, length of time each is late, and last time each checked in.

Filters at the top of each column permit easy search and sort of the contents of the column

Click on any Subscriber ID to open Subscriber Detail Window

	alc	oubscriber offee	N-1113		
Description					
Each Subscriber normally transmits Check-in r might be a problem with the Subscriber, alter	nessa nativel	ges at regular, pre-set interva y, there might be a proble	Clic	Because does not accels a Check in research at the expected time of the constant of the second state of th	oto
Tips				contents of any column	
Ensure that the Subscriber is installed propert	y			· · · · · · · · · · · · · · · · · · ·	
Ensure that the Subscriber is free of faults.					
Ensure that the Subscriber is connected to the	e netv	ork by watching the LEDs on	the Subscriber Po		
Retrieve current Subscriber Timing parameter	s by n	unning the Get Subscriber Tin	ning operation in 1	PCM	
81 Subscribers are late to check in.					
Subscriber ID	•	Late Period	0	Last Check in Time	
1742			6d 06:15:29	10/22/2014, 8:53:52 AM	
140			5d 02:58 13	10/23/2014 12 11:08 PM	
/			5d 01:28:06	10/23/2014. 1:41:16 PM	
9871			4d 22 00 32	10/23/2014, 5:08:50 PM	
9952			18 02:13 17	10/28/2014, 4:41:05 AM	
9485			0d 05:37:17	10/28/2014, 9:32:05 AM	
0756			0d 01:21:23	10/28/2014, 1:47:58 PM	
9618			0d 00.24.56	10/28/2014, 2:44:26 PM	

Late Subscriber Check-Ins

5.7.6 Frequent Check-Ins

Click here for list of Subscribers transmitting more than one Check-In during a 24 hour period. The list shows the number of Check-Ins each Subscriber transmits per 24 hour period. The recommended number of Check-Ins per 24 hours is one. This meets the requirements of UL 864 for Commercial Fire and is appropriate for virtually all applications. A higher number of Check-Ins per 24 hour period can unneccessarily increase RF traffic on network.

Enter text here to automatically search contents of any column

Click on **Frequent Check-Ins** to open a new window with the following information relating the Subscribers on the network:

- A description of the Frequent Check-In Concept
- Tips for generally improving network performance.
- List of the Subscribers that currently are transmitting frequent check-ins and the number of check-ins per 24 hour period.

Filters at the top of each column permit easy search and sort of the contents of the column

Click on any Subscriber ID to open **Subscriber Detail Window**

Enter text here to automatically search contents of any column

	Frequent	Subscriber Check-ins	
Description	C	lick here to automatic contents of any co	ically sort
Each Subscriber normally transmi	its Check-In messages	at regular, pre-set intervals. ALO I	ecommenos setting
The Subscriber Check-In Interval	o 20.45. A shorter tin	e interval increases Ri Tranic in the	e network.
Tips			
Ensure that there are no Subscril	pers with mis-configur	ed Check-in intervals.	\backslash
18 Subscribers are transm	nitting frequent ch	eck-ins.	
Subscriber ID	\$	24-Hour Total	~
1			
9528			18
9528.			18
9528 6359 6343			18
9528 6359 6373 0759			18 6 8 8
9528 6359 7759 0766			18 6 6 5 5 8
9528. 6359 6753 0759 0766 0925			18 6 5 5 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
9528 6359 6759 0759 0766 0925 0945			۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲

Frequent Check-Ins

5.7.7 Subscriber Service Log

Click here for a list of all Subscribers which may require service. This window will give you quick information about what kind of Fault different subscribers are experiencing and there location. You can also click on the Subscriber ID and this will open the Subscriber Detailed window as explained before.

			Sul	oscriber S	Service	e Lo	g		e
Des	cription								
Occa Servi	asionally Subscribe	rs may	/ require servi	ce and this log	dentifies a	all of th	e Subscribers	that are in ne	ed of
Tips	5								
Use	the smart filters be	elow to	filter based o	on address, zip,	type of se	ervice e	tc.		
You	can also use multi	ple filt	ers, based on	the zip and typ	e of fault f	for exa	mple.		
2 St	ibscribers Requi	re Se	rvice				Fault Event,	Address 1, Ad	ldr -
			Address	Address	City A	State	(Decision A	Zip/Postal	
ID \$	Fault Event	*	-	-	ony v	Jun	e/Province ;	couc	
ID ¢	Fault Event	*		-		Jul	errovince 🤤		-
ID \$	Fault Event Battery	•				Jun	errovince ş		

5.7.8 Subscriber Security

Click here to manage the subscribers with suspicious activities by placing them in Quarantine mode. When the NMS detects that IntelliNet2.0 Subscribers are using the same subscriber ID and the same Serial number, these subscribers will be listed here. If deemed necessary, these units can be placed in Quarantine Mode so they cannot participate in the IntelliNet Mesh Network. These subscribers can also be removed from Quarantine Mode to resume participation in the IntelliNet Mesh Network.

Hover over the Subscriber IP from the Suspicious Activity detected subscriber and the Subscriber ID and Serial number will be automatically populated under the Change Subscriber Operation section.

Enter the Admin password for the subscriber and click on Quarantine or Remove Quarantine depending on the state of subscriber.

If you select Quarantine, then once successful, a checkmark will appear in the Subscriber in Quarantine tab next to that particular subscriber.

and the second division of the second divisio						r,
Description						
When the NMS deten number, these subs Mode so they canno Quarantine Mode to	cts th criber t part resu	nat IntelliNet2.0 Subscrib s will be listed below. If o ticipate in the IntelliNet I me participation in the Ir	deem Mesh ntelliN	re using the same subscriber ID and the ed necessary, these units can be placed Network. These subscribers can also be let Mesh Network.	same S in Qua remove	erial rantine d from
Tips						
Ensure that all Subs	cribe	rs have unique Subscribe	er IDs	š.		
Suspicious Activ	/ity I	Detected				
Subscriber ID	٥	Serial Number 🗸	La	st Transmit	٥	
F0F0		F000001	Su	nday, May 14, 2017 05:56:42 AM		×
snange subscri	ber	operation				
		Subscribe	r ID	ABCD		
		Serial Num	nber	D8		
			-			
		Admin Passw	ord			
		Admin Passw Quarantir	ie	Remove Quarantine		

	Subscriber ID	FOFO			
	Serial Number	F000001		- 1	
	Admin Password			- 1	
	Quarantine	Remove Quarantine		- 1	
				- 1	
	Request has been s	ubmitted successfully!		- 1	
ubscribers in Quara	Request has been s	ubmitted successfullyI			
ubscribers in Quara Subscriber ID 🗘 🗘	Request has been s intine Serial Number 🗸	ubmitted successfullyI	\$		

5.7.9 Hops

Click here for a list of Subscribers with 4 or more hops to reach an IP Link in either the most recent transmission and/or the most used route to an IP Link over the past 10 day period. It may be advisable to locate or install an additional IP Link near Subscribers on the list with 4 or more Hops.

Click on **Hops** to open a new window with the following information relating the Subscribers on the network:

- A description of the Hops Concept
- Tips for generally improving network performance.
- List of the Subscribers that are located 4 or more Hops from an IP Link, number of Hops in most recent route, and number of Hops in most used route - over past 10 days.

Filters at the top of each column permit easy search and sort of the contents of the column

Click on any Subscriber ID to open Subscriber Detail
Window

Enter text here to automatically search contents of any column

Description	Click here to an	itomatically sort	
When a Subscriber IP Link is within dire	transmits	a IP Link; otherwise, it sends the pa	ecket
Each step in the rou and consequently the	ute from Subscriber to IP Link is called a Hop. A ne number of Hops, from a given Subscriber to a	n IP link can change.	te,
Tips			
Consider installing	deliver of the last state of the second state of the last of		
Consider installing	additional IP Links near Subscribers with high H	ops counts.	
51 Subscribers	are located 4 or more Hops from an I	pps counts.	
51 Subscribers	are located 4 or more Hops from an II	pps counts. P Link. Hops (Most Used Route)	
51 Subscribers Subscriber ID	additional in 2 Links hear Subscribers with high H are located 4 or more Hops from an II	P Link.	
51 Subscribers Subscriber ID	additional IP Links hear Subscribers with high H are located 4 or more Hops from an II Hops (Most Recent Route)	P Link. Hops (Most Used Route)	×
51 Subscribers Subscriber ID 9610	additional in 2 Links hear Subscribers with high H are located 4 or more Hops from an II Hops (Most Recent Route)	P Link. Hops (Most Used Route)	*
51 Subscriber ID 9611 9699	additional IP Links hear Subscribers with high H are located 4 or more Hops from an II Hops (Most Recent Route)	P Link. Hops (Most Used Route)	×.
51 Subscriber ID 9619 9699 9918	additional IP Links hear Subscribers with high H are located 4 or more Hops from an II Hops (Most Recent Route)	Pps counts. P Link. Hops (Most Used Route)	



Click here for a list of all Subscribers that have transmitted an *Ack Delay* in the past 24 hours as well as the quantity of *Ack Delays* over that period. When any Subscriber transmits an RF packet, the Subscriber recipient of the packet returns a message to the sender acknowledging receipt of the packet. An *Ack Delay* is triggered if a Subscriber does not receive an acknowledgement message of a transmitted signal within the configured Communication Timeout Delay period. *Ack Delays* could indicate a service requirements for a Subscriber or may be explainined by some environmental factor such as the weather. It may be advisable to locate or install additional IP Links near

Subscribers that remain on the list for extended periods.

Click on **Ack delays** to open a new window with the following information relating the Subscribers on the network:

- A description of the Ack delay Concept
- Tips for generally improving network performance.
- List of the Subscribers that have reported an Ack delay over past 24 hours and quantity over that period.

Filters at the top of each column permit easy search and sort of the contents of the column

Click on any Subscriber ID to open **Subscriber Detail Window**

		Ackno	owledger	ment De	lays	٠
Description						
Normally after sender, acknor message withi message that	a Subscriber wledging reconsider the configution Ack Delay	transmits an RF pa eipt of the packet. If red Communication has occurred	cket, the recipi the issuing Sut Timeout Delay	ent of the pack oscriber does period, then it	tet returns a message not receive the ackno indicates in a subsec	a to the wiedgement quent
Tips						
Consider insta	ling addition	al IP Links near Sub	scribers with hi	gh occurrence	es of Ack Delays.	
Consider reloc	ating the Sut	oscriber or its antenr	a elsewhere o	n the premise	s, for better RF recept	ion.
Consider using	the Network	Connectivity Tool (I	NCT) to find the	best subscrit	er location within the	premises
30 Subscrit Subscriber ≎ D	Ack Delays	eporting Ack De Address 1 🗘	Address \$	city 🗘	r5. State/Province ≎	Zip/Postal Code
			1			1
7024	8	730 Georgia Avenue		Azusa	California	91702
/086	4	3695 Startouch Drive		Pasadena	California	91107

5.7.11 NetCon

Click here for a list of all Fire Subscribers that have reported a *NetCon* fault in the last 10 days. *NetCon* is a measurement calculated by a Subscriber to determine the level of confidence that its transmissions will reach an IP Link. When a Fire Subscriber reports NetCon fault, ensure that the other Subscribers communicating with it are operating normally and are free of faults. In may be advisable to relocate the Subscriber or to relocate or change its antenna.

Click on **Netcon** to open a new window with the following information relating the Subscribers on the network:

- A description of the Netcon Concept
- Tips for generally improving network performance.
- List of the Subscribers that have reported a Netcon event over past 10 days and quantity over that period.

Click on any Subscriber ID to open **Subscriber Detail Window**

Descri	ption
NetCon transmis in messa	is a measurement calculated by a Subscriber to determine the level of confidence that its sions will reach an IP Link. Only Fire Subscribers report their NetCon statuses, as either <i>high</i> or <i>lov</i> ages sent to the MultiNet Receiver.
Tips	
When a operatin	Fire Subscriber reports low NetCon, ensure that other Subscribers communicating with it are g normally and free of faults.
Conside	r relocating the Subscriber or its antenna within the premises.

Analytic Tools - NetCon

5.8 Equipment List

Through the *Operator Dashboard*, users can obtain list of all Subscribers and all IP Links on the Business Unit Network. The Operator can sort each equipment list extensively and further click down into each Subscriber or IP Link for important information.

	CORPORATION	Network Manageme System	ent				
BU1	Dashboard	Equipment -	Geography -	Notification -	Maintenance -	нер	
		IP Links Subscribers Non-AES Lini	ts				Monitoring 1 IP Link and 16 Subscribers
	BU1	BU1 Dashboard	BU1 Dashboard Equipment- IP Links Subscribers Non-AES Uni	BU1 Dashboard Equipment- Geography- IP Links- Subscribers Non-AES Links	BU1 Dashboard Equipment- Geography- Norincation - IP Links Subscribers Non-AES Units	BUI Dashboard Equipment- Geography- Notification - Maintenance- IP Links- Subscribers Non-AES Units	BU1 Dashboard Equipment- Geography- Notification - Maintenance- Help IP Links Subscribers Non-AES Links

NOTE: Non-AES Units will show up only if Non-AES Unit addresses have been imported.

5.8.1 Equipment List, IP Links

A list of IP Links along with ID, Model, Revision and Location can be obtained by clicking on **Equipment** then IP Links at the top of the Dashboard. If IP Links are removed from the *MultiNet*, they are automatically removed from this list and no longer monitored. These views can be sorted using the filters at the top of the list and can be easily printed.

To access a list of all IP Links on a network:

Click on **Equipment>IP Links**

Information includes: IP Link ID, Model, Revision and Location

Filters at the top of each column permit easy search and sort of the contents of the column

Click on IP Link ID to open **IP** Links Detail Window



Enter text here to automatically search contents of any column

Next, One-click detail information is available for any specific IP Link. Click on any IP Link ID to open the **IP Link Detail Window** that provides:

- Version of IP Link model and revision
- Location including address and longitude and latitude
- Current faults if any including CID codes
- Number of repeat dependent Subscribers
- Number of generated messages over last 10 days
- A section for Notes
- 10 day searchable and sortable event history

-		IP L	in	k ID:	CAFB			
						٠	H	
Identity								
				Model:	7170			
				Revision:	S1.6.23YS			
Location								
				Address 1:	167 West Springfield Street			
				Address 2:				
				City:	Boston			
		S	Stat	e/Province:	Massachusetts			
		Zij	p/Pe	ostal Code:	02118			
				Country:	: United States			
				Latitude:	42.3394186			
				Longitude:	-71.0790378			
			Ele	evation (ft):	15			
Current Faults	0							
Event Code	^	Name	٥	Time			\$	
	٦		_				_	
E354 00 C906		TCP/IP		Wednesda	ay, May 10, 2017 05:13:51 PM			
Statistics								
Dependent	S	ubscribers	(las	st 10 days):	.3			
Dependent	Sul	bscribers (last	24 hours):	0			
Generate	ed I	Messages	(las	st 10 days):	5			

IP Link Detail View

5.8.2 Equipment List, Subscribers

A list of Subscribers along with ID, Model, Revision and Location can be obtained by clicking on **Equipment** then **Subscribers** at the top of the Dashboard. If Subscribers are removed from the *MultiNet*, they are automatically removed from this list and no longer monitored. These views can be sorted using the filters at the top of the list and easily printed.

To access a list of all Subscribers on a network:

Click on Equipment>Subscribers

Information includes: ID, Model, Revision and Location

Filters at the top of each column permit easy search and sort of the contents of the column

Click on Subscriber ID to open Subscriber Detail Window



One-click detail information is available for any specific Subscriber. Click on and Subscriber ID to open the **Subscriber Detail Window** that provides:

- Type of Subscriber model, revision, serial number, Mac Address, Panel Interface and Compass Number. On those information which is applicable to a subscriber.
- Location including address and longitude and latitude
- Current faults if any including CID codes
- Most Recent Route
- Most Used Route
- Number of repeat dependent Subscribers
- Number of generated messages over last 10 days
- Subscriber Programmed Settings
- 10 day searchable and sortable event history including CID codes

Click the update icon to request the latest information from the Subscriber

Subscriber	ID: CD26
	e R
Identity Ø	
Model:	7007
Revision:	9.9.99
Serial Number:	CC5
Mac Address:	3C-C1-2C-E0-00-50
Panel Interface:	Keypad
Compass Number:	8224000080
Location	
Address 1:	501 Brookside Drive
Address 2:	
City:	Andover
State/Province:	Massachusetts
Zip/Postal Code:	01810
Country:	United States
Latitude:	42.6861355
Longitude:	-71.196882
Elevation (ft):	2
Current Faults C	
(none)	
Most Recent Route	
Hops:	2
Route:	CD26→F0F0→CAFB

Subscriber Detail View

5.8.3 Equipment List, Non-AES Units

A list of Non-AES Units along with ID and Location can be obtained by clicking on **Equipment** then **Non-AES Units** at the top of the Dashboard. Note that this link will show up only if Non-AES Units have been imported in the CSV file for Non-AES Units. The Non-AES Units list can be sorted using the filters at the top of the list and easily printed.

To access a list of all Non-AES Units on a network:

Click on **Equipment>Non-AES** Units

Information includes: ID and Location

Filters at the top of each column permit easy search and sort of the contents of the column

Click on Non-AES Unit ID to open Non-AES Unit Detail Window

One-click detail information is available for any specific Non-AES Unit. Click on and Non-AES Unit ID to open the **Non-AES Unit Detail Window** that provides:

- Location including address and longitude and latitude



No	AES Unit ID: 5000
	M-ALS ONITID. 5000
Location	
Address 1:	30 Railroad Street
Address 2:	
City:	Andover
State/Province:	Massachusetts
Zip/Postal Code:	01810
Country:	United States
Latitude:	42.6600721
Longitude:	-71.1449119
Elevation:	2
Notes	
TAES Metwork For more information of	lease visit www.aes-corp.com

Non-AES Unit Detail View

5.9 Maintenance - Operator Dashboard

Through the Maintenance dropdown on the *Operator Dashboard*, users can easily change the Business Unit password and contact information.

To change the Password Click on Maintenance>Password to launch the screen below

First, enter the current password and then the new password twice and click **OK** to save the new password

BU2	O Dashboard	Equprient •	@ Geography+	A Notification -	≁ Maintenance -	O Help
		M	ainténance / Pa	ssword		
		Bus	iness Unit BU2 Old Password			
			Password New Password 1-32 characters - let	iers, digits, or any o	the following: 1 (8 #	£%**()-
			Password Caclimt			
						OK Cancel

For a list of AES Contact Information, click on Maintenance>Contact to launch the screen below:

Click on Maintenance>Contact

Maintenance / Contact	
AES Corporate Website	
New bescorp.com	
AES Contact Information	
www.aes-cotp.com/contact	
AES in Social Media	

To Send Maintenance Feedback, click on Maintenance>Feedback to launch the screen below:

Enter the Subject and contain in the respective boxes and click on Send Feedback when done

Maintenan	ance / Feedback	
	Subject:	
	1	
		li li
	Send Feedback	

5.10 Help - Operator Dashboard

Through the help tab on the *Operator Dashboard*, users can easily access additional information for help, such as manual, FAQ and videos.

Click Heln ——	CORPORTING System
Chek Heip	Dashboard Poupment- Geography - Nothcation - Maintenance - Help
	Documents
	User Manual
	Frequently Asked Questions
	Videos
	AES YeuTube Channel
	AES Technical Support
	www.aes-Intellinet.com/contact-us/technical-support

6 Dealer Dashboard

6.1 Overview

The *Dealer Dashboard* displays all information available from the *MultiNet* receiver for that Dealer for the last 10 days. Each *Dealer Dashboard* provides the following important information to the operator to help manage, monitor, and maintain the AES-*IntelliNet* network.

O Dashboard	🖀 Equipment -	🕲 Geography - 🖌	Maintenance -	O Help			
					Monitoring 2 IP Lin	ks and 162 Subscribers	
							SUBIE Q
		Network Health	n Score				
							100
			IP Lin	k Service Log		Subscriber Service Log	
		IntelliNet 20 Co	pyright © 2018 Al	ES IntelliNet2.0			

6.2 Login

You can access your *Dealer Dashboard* by signing in at the following URL: <u>http://your_NMS_IP_address</u> to launch the sign on screen below. The username and password are generated by the administrator user of the NMS.

AE	S Inte	lliNet
Business l	Jnit	
Password		
	Sign in	

6.3 IP Link and Subscriber Status Monitoring

If IP Link and Subscriber faults occur, these faults are listed on the IP Link Service Log and Subscriber Service Log.

7 Interactive Visualization

7.1 Overview

Through the NMS *Operator Dashboard*, a user can launch an interactive satellite map of their *IntelliNet* network that uses Google Earth. The map shows the location and status of all IP Links and Subscribers and illustrates the multiple routes for RF signals across the network from each Subscriber over past 10 days.

All interactive satellite maps are refreshed automatically as new data is received. By clicking in any IP Link or Subscriber icon, the following information is accessible: ID, Version, Settings, Location, Current Faults, Communication Trends, editable Notes and Event History. By providing a comprehensive visualization of the network and its subsystems, the network map helps with planning for network expansion. There are four discrete views the user can access for interactive visualization of their network. The four network views are **Utilization**, **Routes**, **Faults**, **and Topology**.

In order to view the visualization feature of NMS, Google Earth (<u>www.earth.google.com</u>) must be installed on the PC you plan to use.

7.2 Enter Subscriber and IP Link Addresses into NMS

In order to view the Visualization feature of the NMS on Google Earth you have to first load the addresses of the Subscribers and IP Links. To import the street addresses go to **Geography** then **Import AES Units**. You can download a template which can be used to import all the addresses. After the addresses are imported, the NMS server will resolve to latitude and longitude and display progress.

7.3 Enter Non-AES Unit Addresses into NMS

You can utilize the NMS Visualization features to place Non-AES units on Google Earth to get an idea where you Non-AES units are located in reference to AES Subscribers and IP Links. To import the Non-AES Unit street addresses go to **Geography** then **Import Non-AES Units**. You can download a template which can be used to import all the addresses. After the addresses are imported, the NMS server will resolve to latitude and longitude and display progress.

7.4 Export Addresses

The NMS also allows you to export already resolved or entered addresses of Subscribers, IP Links or Non-AES units. To export addresses go to **Geography** then **Export**. You can download the addresses and print them or save them and use them as an import file when importing addresses on a different NMS.

7.5 Launch Interactive Visualization

To launch the Visualization function, click on **Geography>Google Earth** to view the screen below



Click on the Google Earth icon to download the .kml file with the Business Unit map information. The Business Unit .kml file will download an icon to the bottom left of the screen.

Next click on he Business Unit .kml file. As Google Earth begins to launch, you will be asked to enter a User Name and password. The user name is the name of the Business Unit and the password is the same used for the *Operator Dashboard* password for that Business Unit. Next, enter user name and password and click **Sign In**.



Enter the name of the Business Unit as the User Name and

Use Operator Dashboard password

Click Sign In.

NOTE: Administrator can sign in as "admin" and use the *Administrator Dashboard* password

After clicking on **Sign In**, the Business Unit data base will load which could take a few seconds.



On the left of the screen will be the NMS Google Earth Summary as detailed above. At the top of the Summary under *Network Management System* is the name of the Business Unit - in this example the Business Unit name is IBA. Below the Business Unit name are check boxes that control whether the Legend and the AES *IntelliNet* logo are visible on screen. Note in the Legend that the AES Fire Subscribers are red, Burglary Subscribers are blue, and unknown Subscribers are white.

Next in the Google Earth Summary are the four Network views which present the interactive maps of the *IntelliNet* network from four different perspectives. The four network views are **Utilization**, **Routes**, **Faults**, **and Topology**.

Next, double click on the **Utilization** view to populate the map with the Subscribers and IP Links from this Business Unit network. The program will zoom into the network geography.

7.6 Utilization View

This view provides an interactive satellite map that highlights the most often used Subscribers for signal delivery across the network to IP Links. The graphical size of the Subscriber icon on the map illustrates relative utilization of each Subscriber as measured by the number of repeat dependent Subscribers.



Utilization View - The larger the Subscriber icon indicates a higher number of repeat dependent Subscribers

One-click detailed information is available for all Subscribers. Click on any Subscriber icon to get a view of the following real time information: Type of Subscriber - model and revision, location including address and longitude and latitude, current faults if any including CID codes, Most Recent Route, Most Used Route, number of repeat dependent Subscribers and number of generated messages over last 10 days, Subscriber Programmed Settings, and a 10 day event history including CID codes.

The components of the network detailed on the interactive map can be modified using the Google Earth Summary. Expanding the check boxes below the **Utilization** view enables users to select, and limit if needed, the Subscribers and IP Links that are displayed based on Subscriber type and Subscriber model.



Utilization View - Google Earth Summary

Users can select Subscribers and IP Links to view on the interactive map using Google Earth Summary

The value of the Utilization view for managing an *IntelliNet* Network is that it can identify potential network bottlenecks to enable proactive network management for optimal performance.

To return to the Utilization view, double click on Utilization in the Google Earth Summary.

7.7 Faults View

This view provides an interactive satellite map of all subscribers with a current fault condition. Subscribers with a new fault will automatically appear on the map. When a fault restores, the Subscriber will disappear from this view. To access the Faults view, double click on **Faults** in the Google Earth Summary.



Faults View - User can display Subscribers with a current fault real time and click down for details to plan service

One-click detailed information is available for all Subscribers in the Fault view. Click on any Subscriber icon to get information on the current fault and a view of the following real time information: Type of Subscriber - model and revision, location including address and longitude and latitude, current fault CID codes, Most Recent Route, Most Used Route, number of repeat dependent Subscribers and number of generated messages over last 10 days, Subscriber Program Settings, and a 10 day event history including CID codes.

The Subscribers with a fault that are detailed on the interactive map can be modified using the Google Earth Summary. Expanding the check boxes below the **Faults** view enables users to select, and limit if needed, the Subscribers with a fault that are displayed based on Subscriber type, Subscriber model, or by event code. For example the illustration below details Subscribers with a fault sorted by event code - see the Google Earth Summary check boxes.



Users can select Subscribers to view by type and model or event code

The value of the **Faults** view is that it can simplify planning for routine service of Subscribers so that it can be scheduled cost effectively within normal workflows.

7.8 Mesh Topology View

This view provides an interactive satellite map of all Subscribers and illustrates on the map the RF paths between each Subscriber and the IP Links. In additional to detailed Subscriber information, user can click on any path and obtain RF Link data including the beginning and end nodes and the distance between the nodes.



Topology View - User can display RF paths between Subscribers and IP Links

One-click detailed information is available for all Subscribers in the Topology view. Click on any Subscriber icon to get a view of the following real time information: Type of Subscriber - model and revision, location including address and longitude and latitude, current faults if any including CID codes, Most Recent Route, Most Used Route, number of repeat dependent Subscribers and number of generated messages over last 10 days, Subscriber Program Settings, and a 10 day event history including CID codes.

One-click information is also available on any of the RF paths between Subscribers and IP Links illustrated on the map. Click on a line representing an RF path to create a pop up box with the details of that particular RF Link that includes the distance of the link and ID of the beginning and end nodes of the link.



User can access the details of any RF path on the network

The components of the network detailed on the interactive map can be modified using the Google Earth Summary. Expanding the check boxes below the **Topology** view enables users to select, and limit if needed, the Subscribers and IP Links that are displayed on the map based on Subscriber type and Subscriber model.



Topology View - Google Earth Summary

Users can select Subscribers to view by type and model

The value of the **Topology** view is that it is a powerful tool for planning network growth - detailing optimal locations for new Subscribers and the basis for planning expansion into new geographies.

7.9 Routes View

This view provides an interactive satellite map that enables users to view the historical RF paths, or routes, between Subscribers and other Subscribers, and Subscribers and IP Links over the past 10 day period. It shows route

information on the map that includes most recent route, most used route, as well as details on adjacent nodes and peers. To access the Routes view, double click on **Routes** in the Google Earth Summary.



Routes View - Users can access historical RF path information for any Subscriber

One-click detailed information is available for all Subscribers in the Routes view. Click on any Subscriber icon to enable interactive access to route information. Use the check boxes at the bottom to generate specific route information on the map. This information includes most recent route, most used route, all routes used, and to identify adjacent nodes. Below is an example of detailed information generated in Visualization to identify the adjacent nodes for a Subscriber on the network.





Click on **Show Adjacent Nodes** and then click **Apply Settings** to illustrate on map all other Subscribers with which this Subscriber has exchanged RF communication in the past 10 days. One-click information is available for the RF paths illustrated on the map. Click on a line representing an RF path to create a pop up box (see above) with the details of that particular RF Link that includes the distance of the link and ID of the beginning and end nodes. You can perform the same request on any IP Link as well and see all Subscribers that have exchanged RF communication in the past 10 days with that IP Link.

The components of the network detailed on the interactive map can be modified using the Google Earth Summary. Expanding the check boxes below the **Routes** view enables users to select, and limit if needed, the Subscribers that are displayed based on Subscriber type and Subscriber model.

Routes View - Google Earth Summary



Users can select Subscribers to view on the interactive map by type and model

8 Notification

8.1 Notification Set-up

The Notification function enables users to monitor their *IntelliNet* network from anyplace at any time. Through the *Operator Dashboard*, users can configure automatic alerts based on a change to the *Network Health Score* or a fault with any Subscriber or IP Links. Separate drop down menus enable the user to easily create the list of personnel to be notified by both SMS and email, define the fault criteria to be reported, and create associations between the alert triggers and personnel to optimize response.

COR	PORATION Ne	etwork anagement stem			
guardian	Dashboard	Equipment +	Geography +	Notification -	Maintenance+ Help
				Recipients Triggers Associations	Monitoring 14 IP Links and 11882 Subscribers
					Set up Notifications

In order to set up and manage the Notification function, click on **Notification** and then on each of the following sections:

- **Recipients** To identify personnel that receive one or more alerts
- **Triggers** To define network events from which to generate alerts
- Associations To map personnel or recipients to trigger events

8.2 Recipients

To add personnel to the alert list or to edit information about an existing Recipients, change the status of a Recipient, or delete a Recipient, click on **Notification** > **Recipients** to launch the screen below.

	IBA Dashboard E	Network Management System quipment - Geograph	Notification -	Maintenance -			-	5	
Click on Notifications > Recipients //	Notificatio	n Recipients		Add Recipient					
	First Name	▲ Last Name ♦	Description \$	Email Address	Mobile Phone \$	Mobile Carrier	Status 🗘		_
	George	Jones	Manager	GJones@company.com	1234567891	T-Mobile	Enabled	1	ж
	Martha	Smith	Manager	msmith@company.com	1123456789	AT&T	Enabled	£	ж

Recipient View

To edit an existing Recipient, click on the pencil icon to bring up the Edit Recipient screen. In this screen you can also change the status of a Recipient from Enabled to Disabled. SEE NEXT PAGE.

To delete a Recipient, click on the X icon to the far right. You will be asked to CONFIRM that you want to delete the Recipient.

To add a new Recipient, click on Add Recipient button at top. SEE NEXT PAGE.

	Add Recipie	nt
To add a new Recipient, click on Add Recipient button at top of Recipient view	Last Name	
	Description Description	
Input contact information including email address and / mobile phone number	Email Address Email Address	
	Mobile Phone (10 Digits Only!)	
Click OK to complete and save the Recipient information.	Mobile Carrier	
	Mobile Carrier Status	
	Enabled	Ŧ
	OK Cancel	

Add Recipient View

8.3 Triggers

To add a network events that will trigger an alert, click on **Notification >Triggers** to launch the Manager Triggers screen below - In this screen you can also edit or delete an existing Trigger.

	AES CORPORATION Network Management System	and the	Comment of the second
	Dashboard Equipment- Geography-	Notification - Maintenance -	
Click on	Notification Triggers		
Notifications > Triggers	F	Add Trigger	
	Name	Description	٥
	IP Link "Interference" > 2	An IP Link "Interference" Fault has occurred on more than 2 units.	1 8
	Network Health Score < 70	2 *	
	Subscriber "AC" > 2	A Subscriber "AC" Fault has occurred on more than 2 units.	1 8
	Subscriber "Battery" > 4	A Subscriber "Battery" Fault has occurred on more than 4 units.	1 ×
	Subscriber "Loopback" > 10	A Subscriber "Loopback" Fault has occurred on more than 10 units.	1 *
	Subscriber "NetCon" > 20	A Subscriber "NetCon" Fault has occurred on more than 20 units.	1 1
	-	Manage Triggers Screen	

To edit an existing Trigger, click on the pencil icon to bring up the Edit Trigger screen.

To delete a Trigger, click on the X icon to the far right. You will be asked to CONFIRM that you want to delete the Trigger.

To add a new Trigger, click on **Add Trigger** button at top of Manage Triggers Screen

There are three criteria for triggers - see below.

Click OK

to complete and save the Trigger information.

bttps://172.17.0.152	/trigger.html?buName=guardi	an&id=
	Add Trigger	
Name		
Network Health Score	< 80	
Description		
The Network Health S	core has dropped below 80.	
Notify associated Rec	ipients when	
Network Health Score		
Network Health Score IP Link Event Subscriber Event	3	
00		

Add Trigger View

There are three criteria for each alert Trigger event defined.

- Fault source there are 3 possible fault sources (1) a reduction in the Network Health Score below a set score, (2) an IP Link Fault, and (3) Subscriber Fault
- Fault type These are defined in the drop down lists for Subscriber Fault and IP Link Fault
- Minimum events needed to alert the number of occurrences requires to send the alert

Input your selections from the three criteria above then click OK to complete and save the Trigger.

8.4 Associations

To map Recipients to Triggers, click on **Notification > Associations** to launch the screen(s) below - In these screens you can view list of recipients and associated Triggers or a list of Triggers and associated Recipients depending which 'view by' box is checked at the top of the screen.

Click on Notification >	CORPORATION Network Management System			~~~		
Associations	IBA Dashboard Equipment Geograph	y - Notification - Main	iteniince •			
Sorted by Recipients and	Notification Associations					
associated Triggers	First Name 🔺 Last	t Name 🌣	Description 0	Associations		
	George Jone	5	Manager	Network Health Score < 70		1
To add or edit an association	Martha Smit	h	Manager	Subscriber "AC" > 2 Subscriber "AC" > 2		+
Click on the pencil icon	CORPORATION System				-	
Sorted by Triggers and	IBA Dashtioard Equipment - Geograph	y- Notification- Main	itenance -			
associated Recipients	Notification Associations	Recipients Triggers Associations				
	View by Recipient Trigger Name	Description	·		Associations	
	IP Lisk Totalesses" > 2	An IP Link "Interference"	Fault has accured an mass than 2	unite.		
To add or edit an association	Network Health Score < 70	The Network Health Scon	e has dropped below 70	unts.	George Jones	1
Click on the pencil icon	Subscriber "AC > 2 Subscriber "Battery" > 4	A Subscriber "AC" Fault h A Subscriber "Battery" Fa	as occurred on more than 2 units. ult has occurred on more than 4 un	ts.	Martha Smith Martha Smith	1
	Subscriber "Loopback" > 10	A Subscriber "Loopback" f	Fault has occurred on more than 10	units.	none	1

To set a new Association or edit an existing Association, click on the pencil icon on the right of the grid. See screens below. Use arrows as needed to manage Associations and click on **OK** to save.

Set a new or	Set Trigger Associations	Set Recipient Associations
edit an	Trigger	Recipient
existing	Name: Network Health Score < 70 Description: The Network Health Score has dropped below 70.	First Name: George Last Name: Jones
Association	Recipients Not Associated Associated Usersa Solida Connections	Description: Manager Triggers
Use arrows to adjust Associations		Not Associated IP Infinitemenes* 23 Subscriber "Act" > 2 Subscriber "Act" > 2 Subscriber Tastrey > 4 Subscriber Tastrey >
Click OK —	OK Cancel	

NOTE: If a notification has been already sent out to existing recipients, all new recipients added after this notification will not receive notifications until the status of the associated triggers drops below the threshold. Only after the trigger status is below the threshold will the new and existing recipients receive notifications when the threshold is surpassed. If a threshold condition remains the same or increased, the next notification will be sent after 24 hours.

9 Revision History

Revision	Date	Notes
1	3/16/2018	Initial document
2	1/24/2020	Update server specification information
2a	5/25/2022	Power consumption detail added
2b	11/18/2022	Added New Appliance and Spec & Changed NMS Photo of backplate

10 Warranty

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