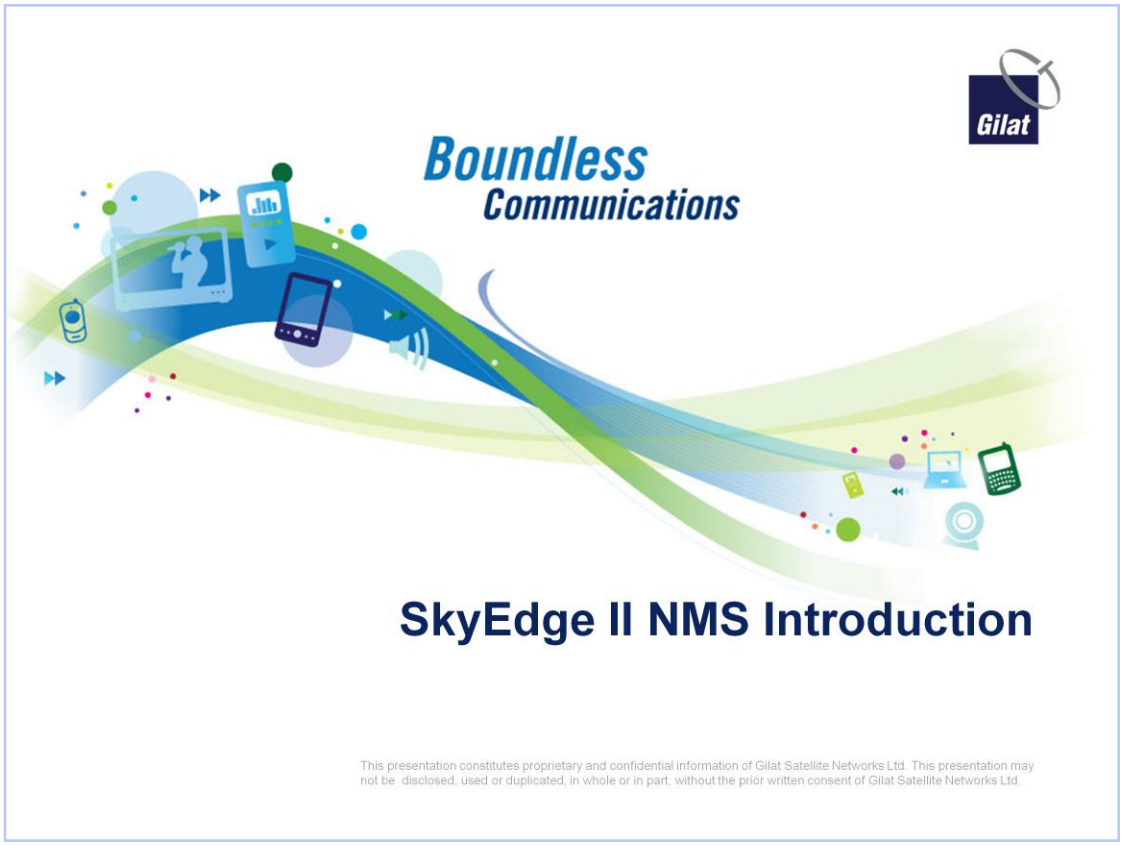
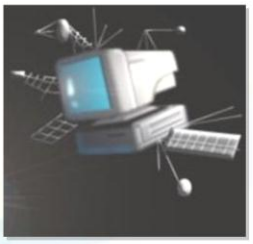


Network Management System (NMS)

- NMS monitors and controls communications in the network
  - Enables viewing, modification and download of individual configurations of hub elements and remote terminals
- Client/server architecture provides centralized management and control, while giving access to multiple operators
- Advanced user interface used for
  - Network configuration
  - Operation management
  - Monitoring and control
  - Alarm and event display
  - Statistics gathering
  - Windows based with full SNMP support



Security

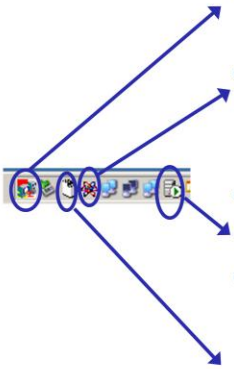
Internet

- NMS server can only be accessed through the NMS browsers
- The NMS browsers network is not accessible from the Internet
- The only component that, if user allows it, can be reached through the Internet, is the Remote Access Router
- Make sure the antivirus definitions are up to date, on the management PC, the NMS browser PCs and both NMS servers


Gilat
NMS Server Start Up
4

NMS Application Icons

- Four application icons can be seen at the taskbar (bottom right of the screen)

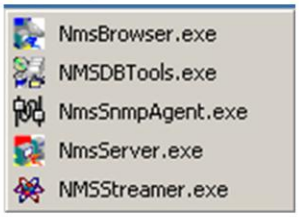


- NMS Server icon - The actual application that controls the network
- NMS Streamer icon - The application that 'streams' the software and some configuration parameters to the VSATs
- NMS MSSQL Server – Looks after the NMS Database, configuration parameters, and software
- File Manager – Enables easy access browsing through the NMS server from the NMS Browser (Server Files function)

Starting the NMS

NMS Server and NMS Browser Icons

- **On the NMS Server, at the "Start menu programs", select *NMS > NMS Server* icon to start the NMS Server. The NMS Streamer and the file manager should start shortly after it**

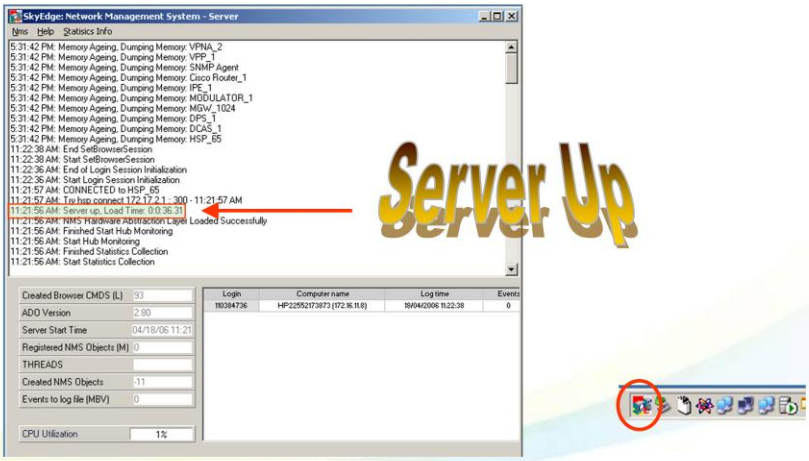


- **From a PC with access to the NMS, go to "Start menu programs", and select *NMS > NMS Browser***

Starting the NMS

Server Window

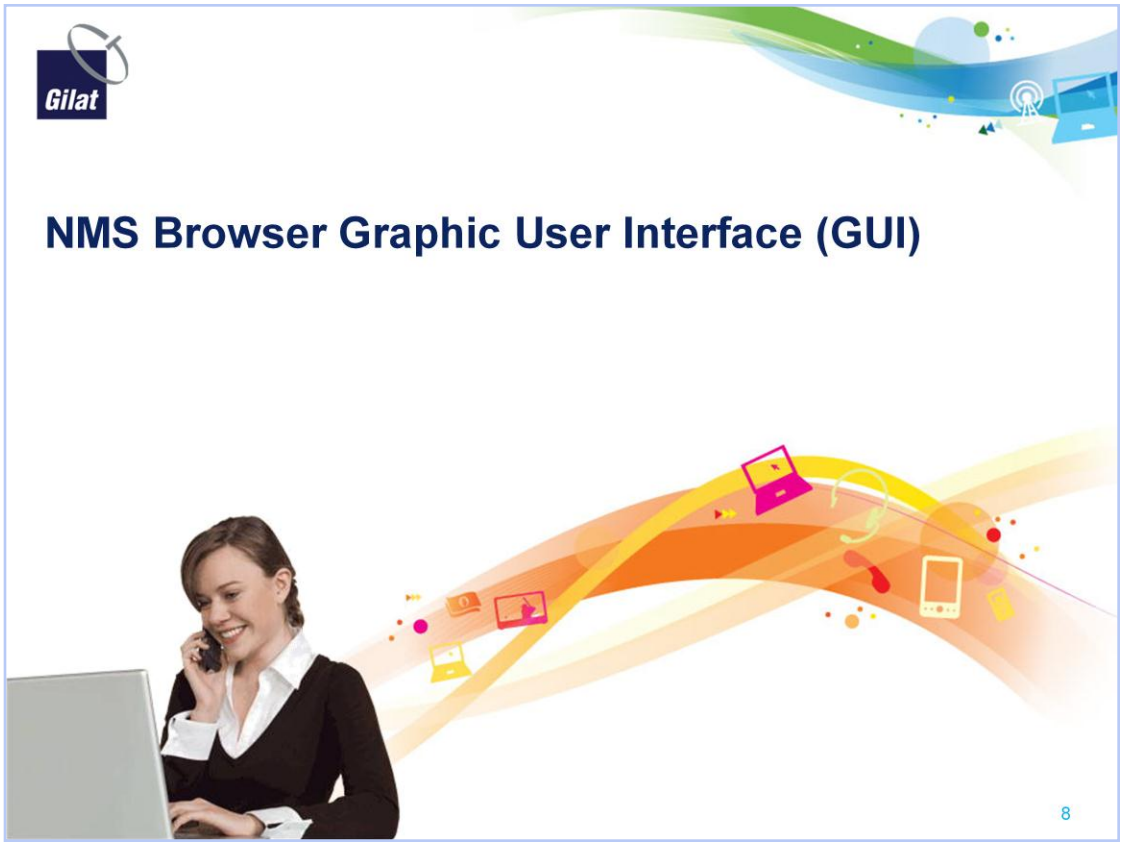
- You can view the NMS Server initiation process in the NMS Server Info display. To open the NMS Server Info display, right-click the NMS Server icon and select Show



Confidential and proprietary information

7

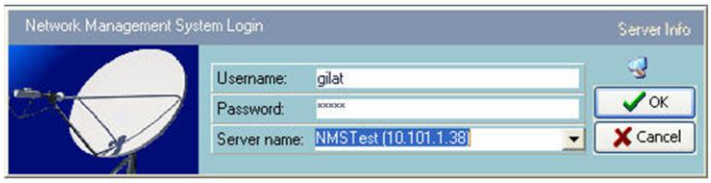
The NMS Server Info Display is used to monitor the NMS server boot-up process, components s/w upload process.
This screen can provide technical information for troubleshooting procedures.


Gilat
NMS Browser Graphic User Interface (GUI)
8

Starting the NMS

NMS Server Login window

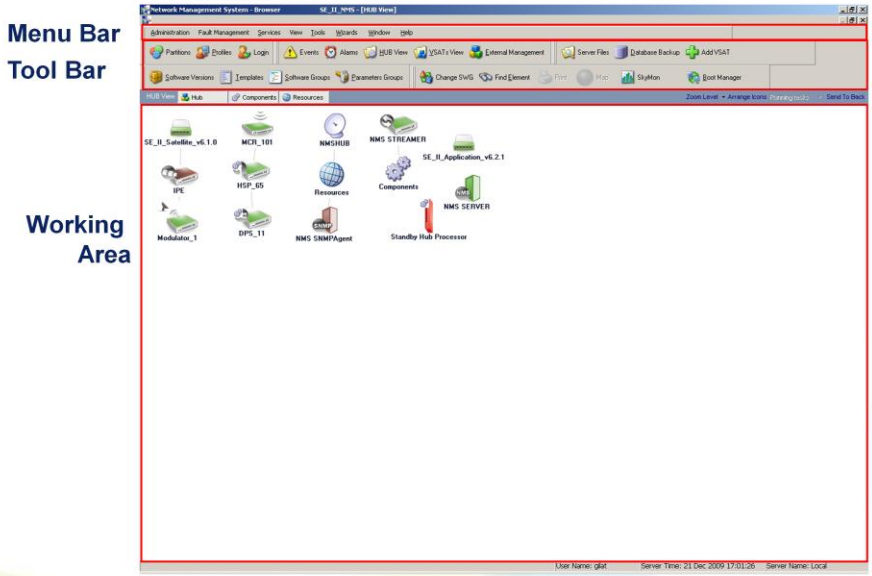
- **The NMS Server Login window is displayed**
- **Enter Username and Password**
- **At the Server name field, indicate the server name and IP address you wish to connect to**



Normally the provided administrator's User Name is: gilat, Password is: gilat.
In the NMS Server Login window, type the Username and password; then select the NMS Server name from the drop-down list and click **OK**.

Starting the NMS

The NMS Browser Opening Screen

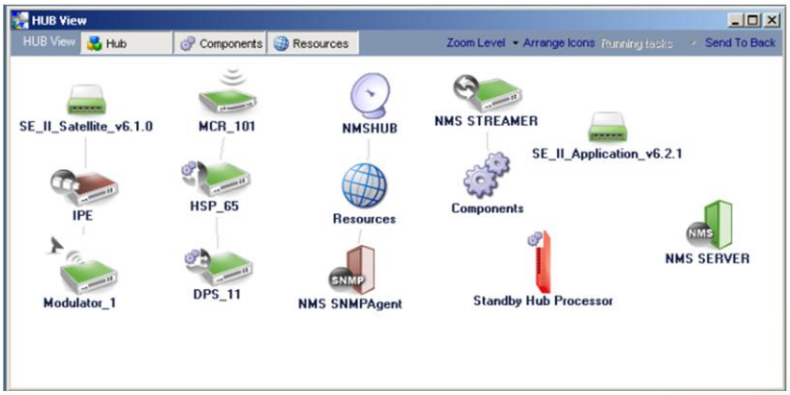


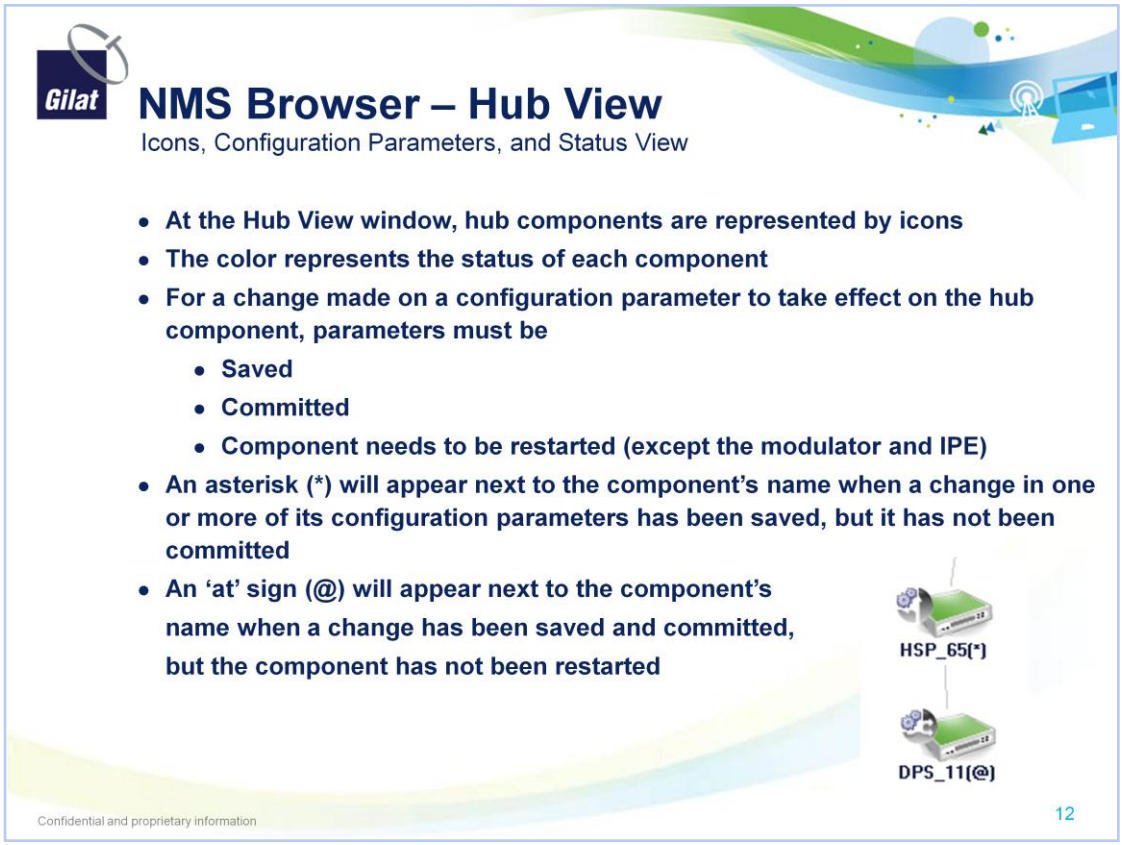
The NMS Browser is the graphic user interface (GUI) that acts as a client. The NMS Browser runs on a different PC, connected via LAN to the NMS Server.

NMS Browser – Hub View

- The Hub View button 

opens the hub view window





The icons color code and meanings follows:
Blue – Unknown severity level.
Cyan – Disabled element.
Gray – Unmanaged.
Green - Normal trace events recorded by the network.
Yellow – Warning severity event.
Orange – Minor severity event.
Maroon – Major severity event.
Red - Critical severity event. The network might be non-operational.

Notes about parameters configuration:

- Parameter changes that have been saved, can be undone by not saving and closing the configuration window, or by clicking on the "Undo" button.
- Parameter changes that have been saved and committed cannot be undone. At this point parameters are already loaded into the relevant component. The option appearing as "Undo committed changes" (right click Configuration menu) is not currently implemented and therefore we do not advise to use it.
- Parameter changes that have been saved, committed, and then the component rebooted, cannot be undone.

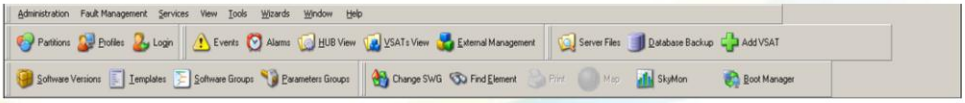
Components are grouped hierarchically. Linked elements can be committed on one action by right clicking on the component, and selecting Configuration > Commit Changes (Include linked elements.

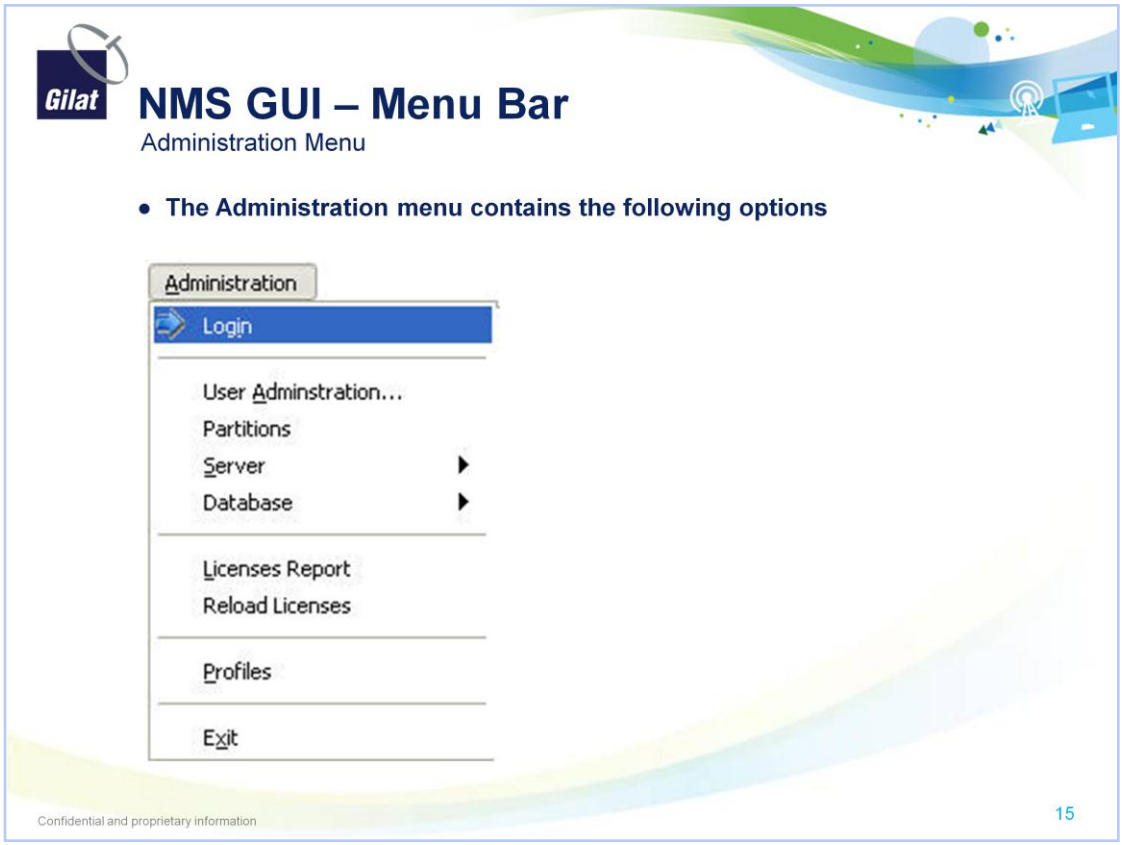
Telemetry and Statistics

- The Telemetry tool enables the system operator to monitor the activity, the configuration and performance of network elements.
- There are two types of telemetry/statistics:
  - Single - Polls the selected network element once
  - Multiple - Polls the selected network element at fixed intervals
- Statistics will be generated at an interval set by the operator. In order to set the polling interval, right-click Multiple icon and select Set Interval

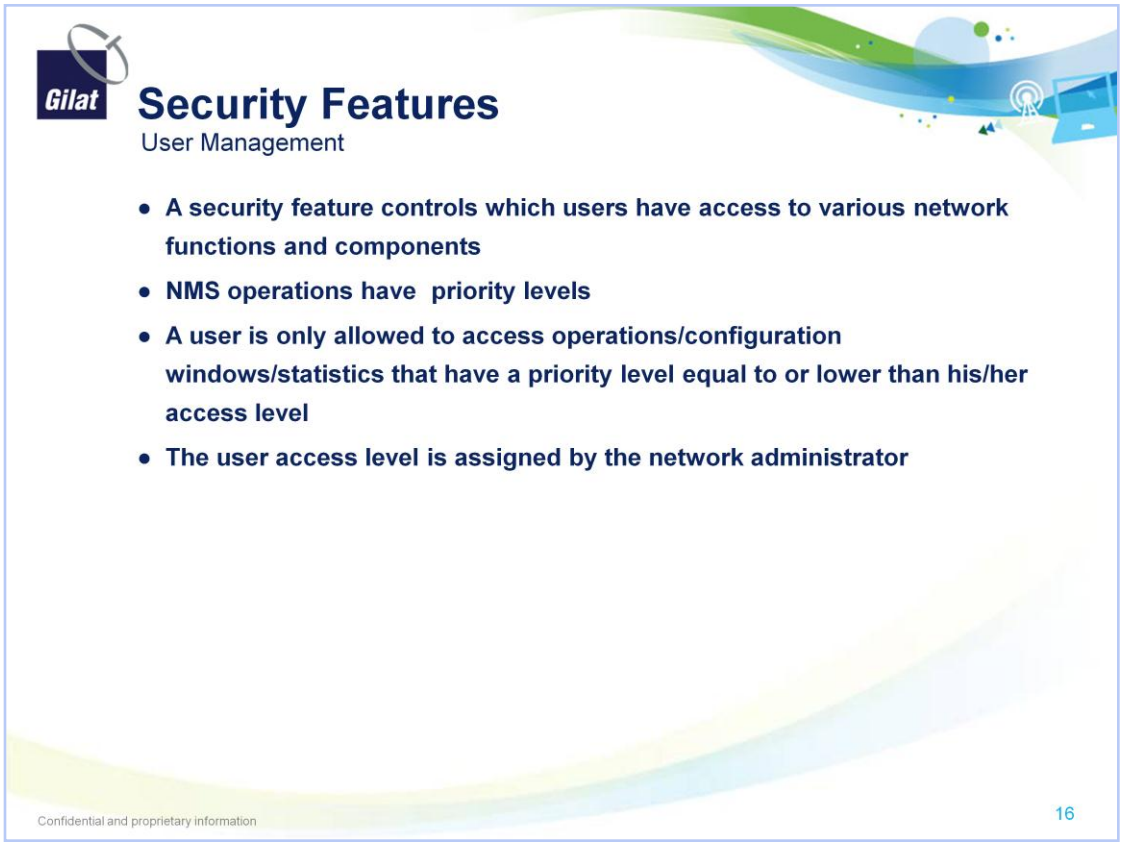
NMS GUI – Menu Bar

- The Menu Bar has the following menus
  - Administration Menu
  - Fault Management
  - Services Menu
  - View Menu
  - Tools Menu
  - Wizards Menu
  - Window Menu
  - Help Menu





Login – Open the NMS Login window and allows logging into as a different user or logging into a different NMS Server.
User Administration - Opens the User Administration window.
Partitions - Opens the Partition management window.
Server - Displays a sub-menu that enables you to change the Server Properties and manage the Server files.
Database – Enables access to the backup function.
Licenses Report – Displays the license report.
Reload Licenses – Opens the Reload licenses function. ***This option should only be used while following directions from Gilat Technical personnel.***
Profiles - Opens the Profiles editor window.
Exit - Closes the NMS Browser.



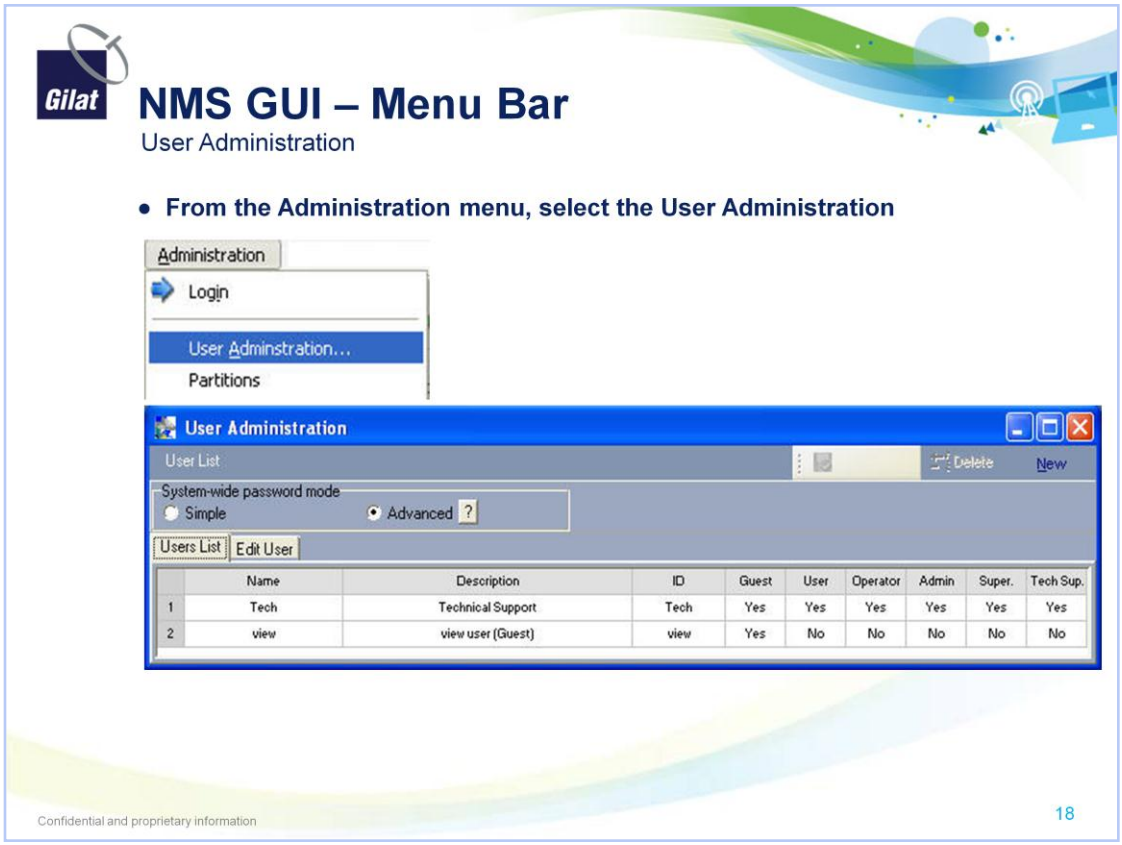
The NMS user access control mechanism restricts the access of various customers sharing a Hub to their own network components and defines different levels of access according to the authorization profile of the user.

NMS GUI – Menu Bar

User Administration - Access Levels

- **There are six categories of user access that can be assigned to the NMS users**
- **The lowest level (View) is the default and is assigned to all users**
- **Each level includes all of the levels beneath it**

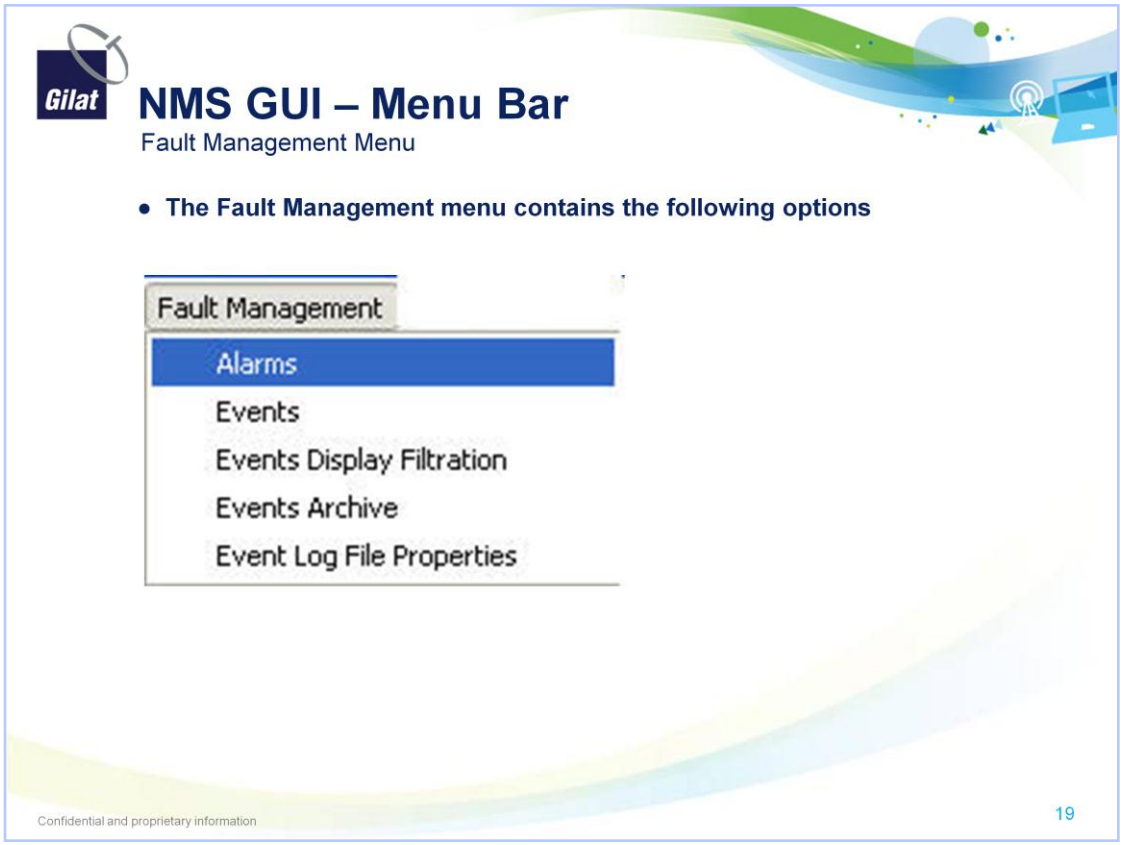
User Level	Description
Tech Support (Highest)	This user level is an unique user, with rights to change the critical parameters.
Supervisor	The user can fully configure the network
Admin	The user can configure the network and define Log record filters, but cannot work with User Partitions.
Operator	The user can execute network commands.
User	The user can view and monitor network telemetry and statistics
Guest (lowest)	The user can view the network configuration.



In the *System-Wide Password mode*, if choosing advanced, the password given must follow the following rules:

1.The password length should be between 8 to 20 characters.
2.The password must include at least one uppercase character.
3.The password must include at least one lowercase character.
4.The password must include at least one Numeric character.
5.The password must include at least one non Alpha-Numeric character.
6.The password should not resemble to the user ID or username.

To edit a user, double click the user or choose a user from the user administration window and click the *Edit User* tab.
To create a new user, click the *New* button at the upper right corner of the user administration window .

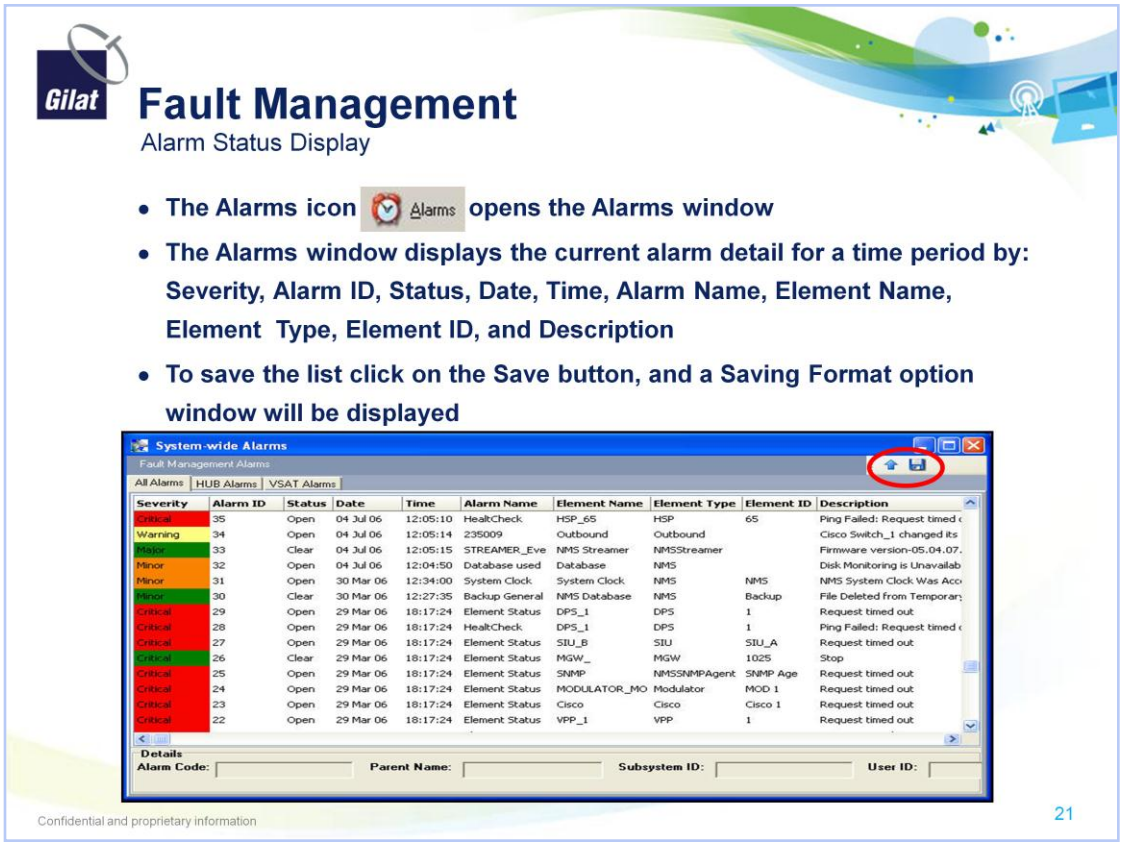


Alarms - View a textual information log (date, time, type, etc.) concerning all alarms.
Events - View a textual information log (date, time, type, etc.) concerning all system events and alarms.
Events Display Filtration – Gives access to Filtration wizard, to create, modify, delete Event filters.
Events Archive – Opens a tool to retrieve events upon a variety of criteria such as Date, Event ID, Severity and other.

Fault Management

Event and Alarm

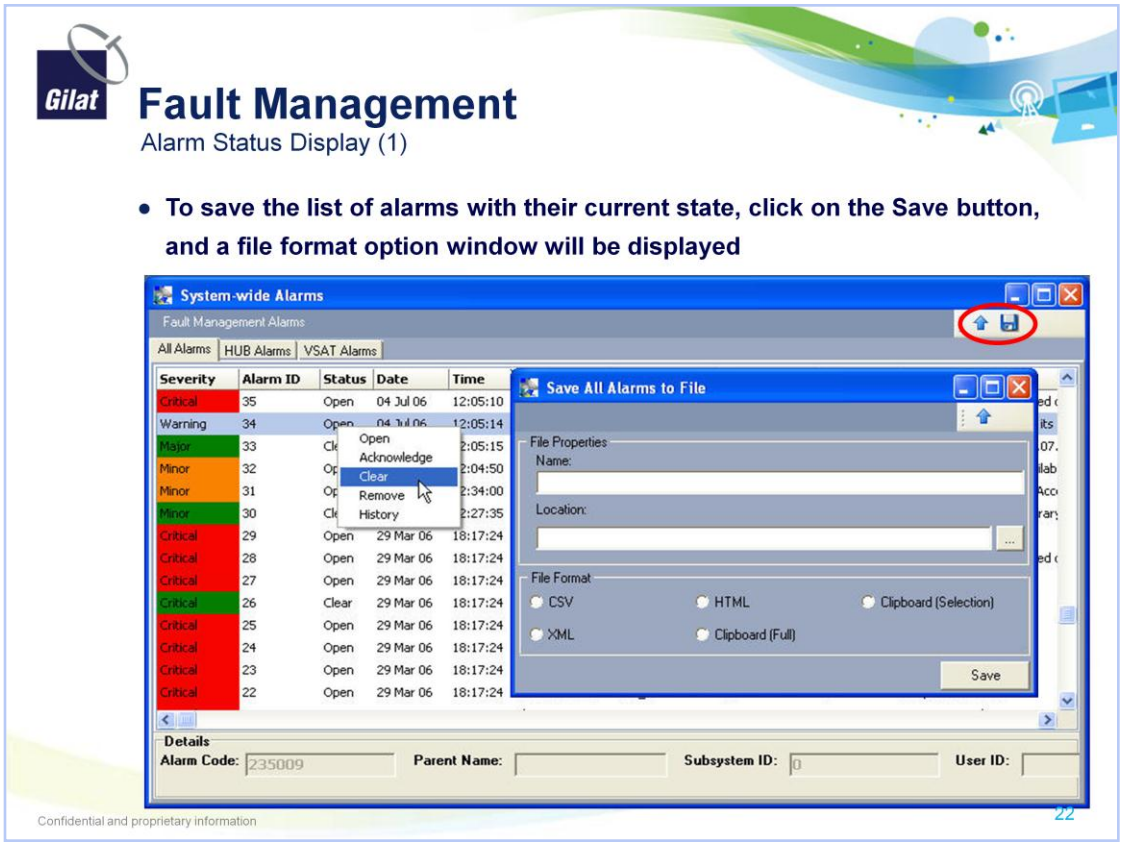
- Any change in the status of a network element is shown to the operator in a graphic color-coded event that contains textual information about the status change
- The same information is also saved in a Log file for later retrieval
- The Log file can be found at – *D:\NMS\Log\NMS_yymmdd.log* or at the path defined in the *NMS.ini file*



Alarms are generated by events and are tagged to the component that is identified by the event. Alarms are color-coded to indicate severity.

Alarms are color-coded as follows:
Blue – Unknown severity level.
Cyan – Disabled element.
Gray – Unmanaged.
Green - Normal trace events recorded by the network.
Yellow – Warning severity event.
Orange – Minor severity event.
Maroon – Major severity event.
Red - Critical severity event. The network might be non-operational.

The user can view only VSAT Alarms or only HUB Components Alarms by choosing *VSAT Alarms* or *HUB Alarms tabs*



When right clicking an alarm, an Alarms management window will open. Each alarm has three states:

Open – When an alarm is created it is automatically in the open state.

Acknowledge – After registering the alarm, the hub operator can change its status to acknowledge. The alarm will continue to be displayed in the Alarms window.

Clear - An alarm is cleared either by an event that indicates that the problem no longer exists, or by an operator that feels that the problem that caused the alarm no longer exists. The cleared alarm will continue to be displayed in the Alarms window.

When the problem indicated by the alarm has been solved, the hub operator can remove the alarm from the display by clicking the *remove* option. Once an alarm is removed from one Alarms window, it is automatically removed from all Alarms windows on all NMS clients.

Once an alarm is opened it remains open until it is both cleared and acknowledged. An alarm is acknowledged by an operator taking action to indicate that the alarm has been seen.

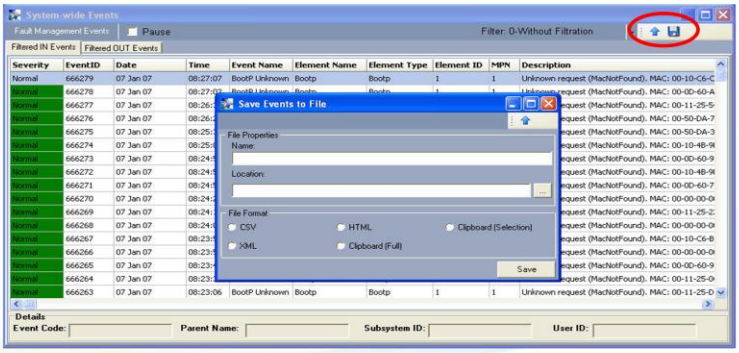
Remove – removes the alarm from the Alarm window.

History – will show all the history alarms of the specific component of the chosen alarm.

Fault Management

- The Events button 

in the Tool bar opens the Fault Management Events window
- The Events window contains a list of all events in the system over time. The following information is provided for each event: Severity, Sequential event ID number, Date, Time, Event Name, Element Name, Element Type, Element ID, and Description



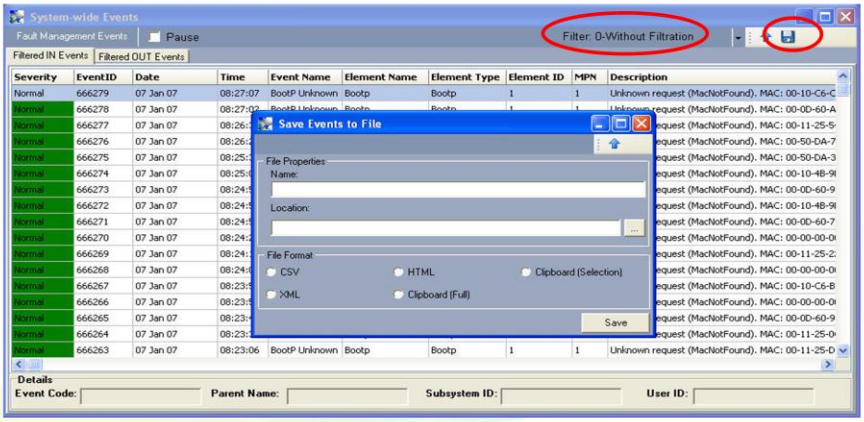
The Event Log information is sequential and includes the source identification and description of the event. The events are color-coded:
Green – Normal trace events recorded by the network.
Blue – Unknown severity level.
Cyan – Disabled element.
Gray – Unmanaged element.
Yellow – Warning severity event.
Orange – Minor severity event.
Maroon – Major severity event.
Red – Critical severity event.

The events shown in the system wide events window can be saved, filtered, sorted and paused for the convenience of the user.

Fault Management

Event Log Display (Cont.)

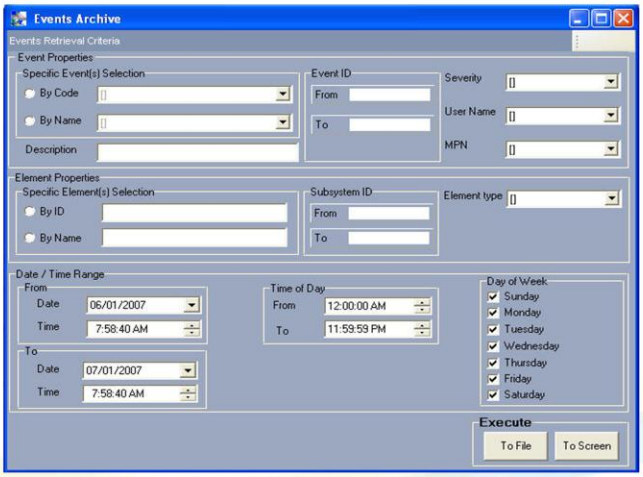
- The filter option allows the activation of a filter to a more convenient view as well as to manage only the relevant events. To allow that, filters must be initially created through the Event Display Filtration Wizard
- The Save button, allows to export the events present in a variety of formats (XML, XLS, HTML. Clipboard, etc.)



Fault Management

Events Archive

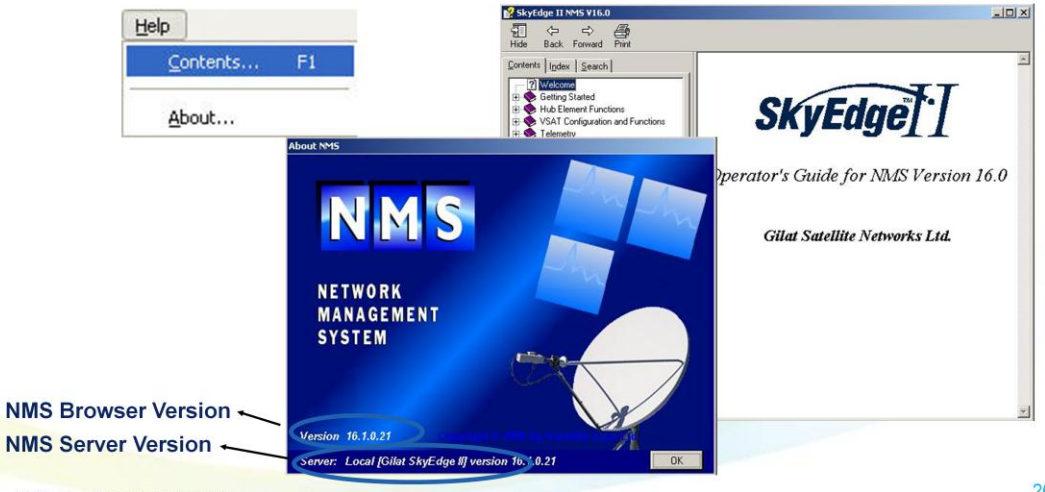
- **The Event Archive enables the user to search for events that were removed from the Event window and are stored in the NMS Events Archive database**



NMS GUI – Menu Bar

Help Menu

- The Help menu contains the following options
  - Contents - NMS User Manual Help file
  - About – displays the NMS Version information




Gilat
NMS VSAT Configuration Building Blocks
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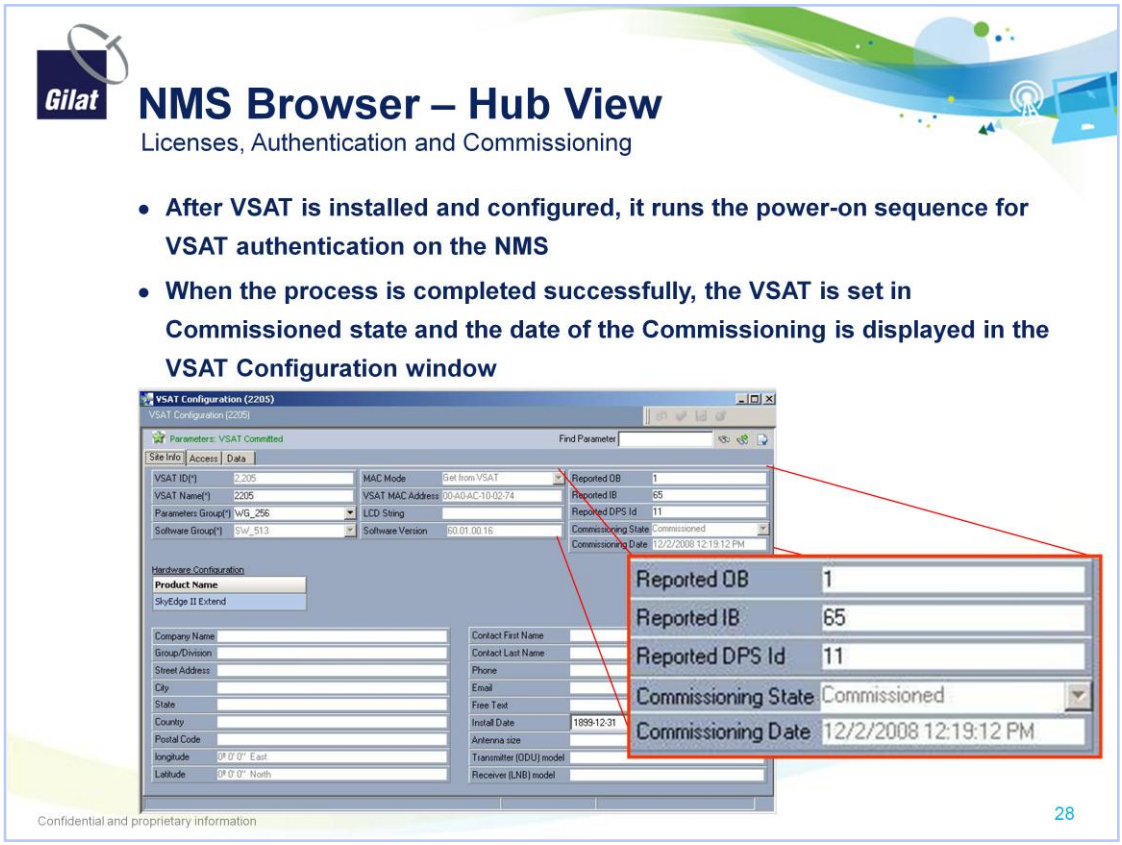


After the VSAT authentication process has been completed, the VSAT MAC Mode parameter cannot be modified. Issuing the Release license command allows modifying the VSAT MAC Mode parameter and changing the VSAT authentication mechanism.

To release the VSAT license and modify VSAT authentication mechanism:

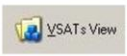
Open the VSAT Manager window.

Browse to the relevant VSAT.

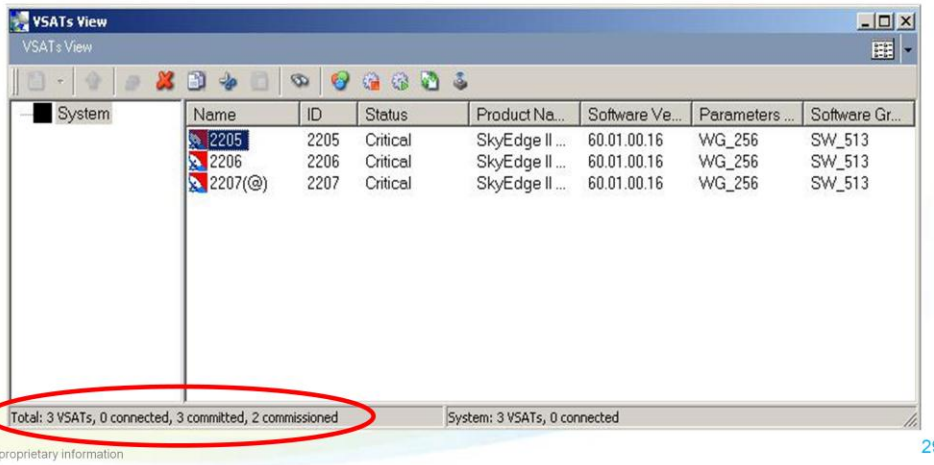
Right-click the VSAT and select Release license.

A progress window will be displayed

NMS Browser – VSAT Manager

- The VSATs View icon 

opens the VSAT manager window
- The number of total configured VSATs, Connected VSATs, Committed VSATs and Commissioned VSATs is indicated in the bottom-right corner of the window

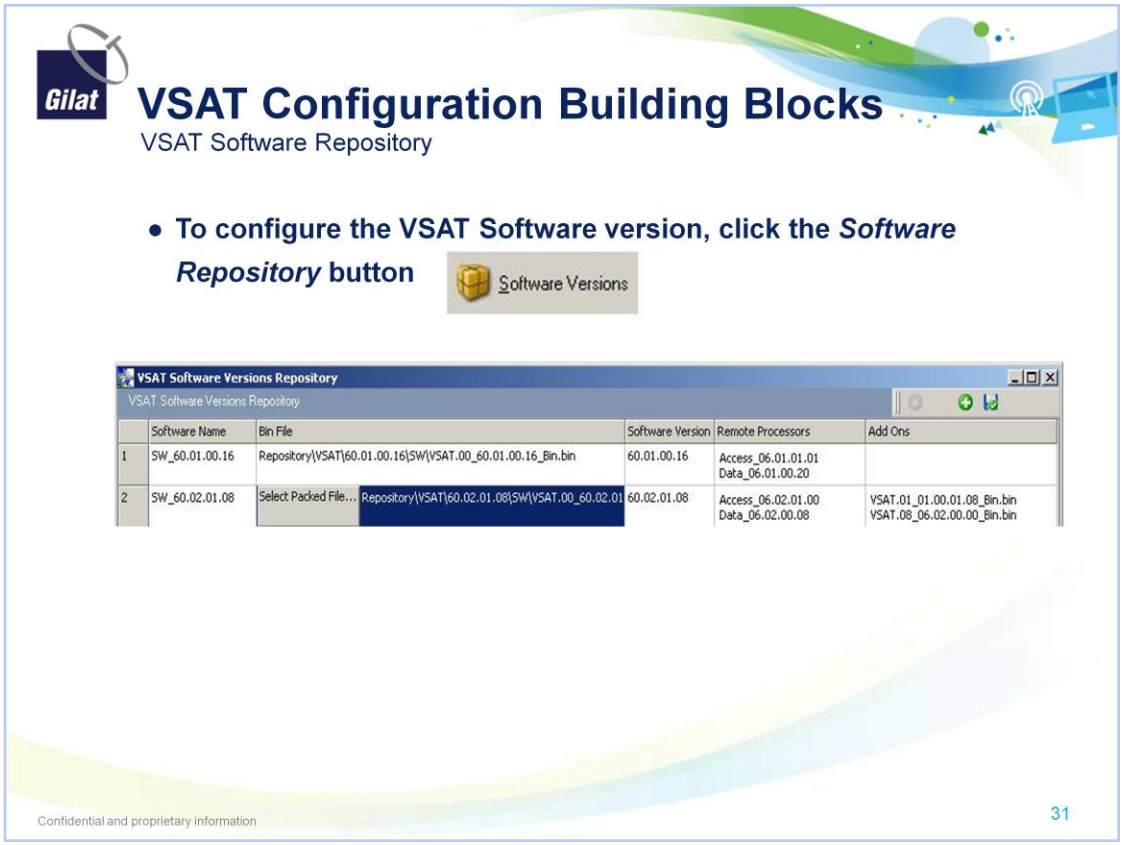


Connected VSATs: Indicates the number of VSAT that are currently online and ready to service.
Committed VSATs: Indicates the number of VSATs that have been saved and committed.
Commissioned VSATs: Indicates the number of VSATs that have been authenticated and authorized.

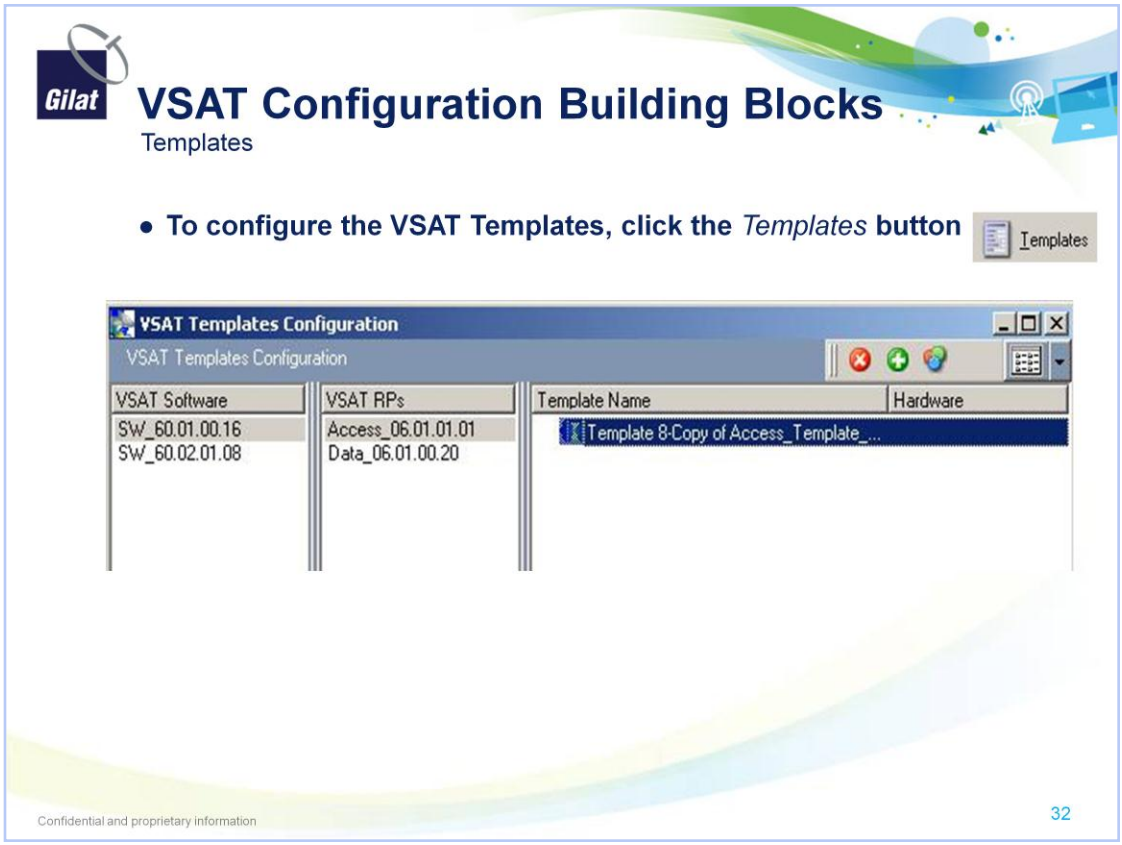
VSAT Configuration Building Blocks

General Description

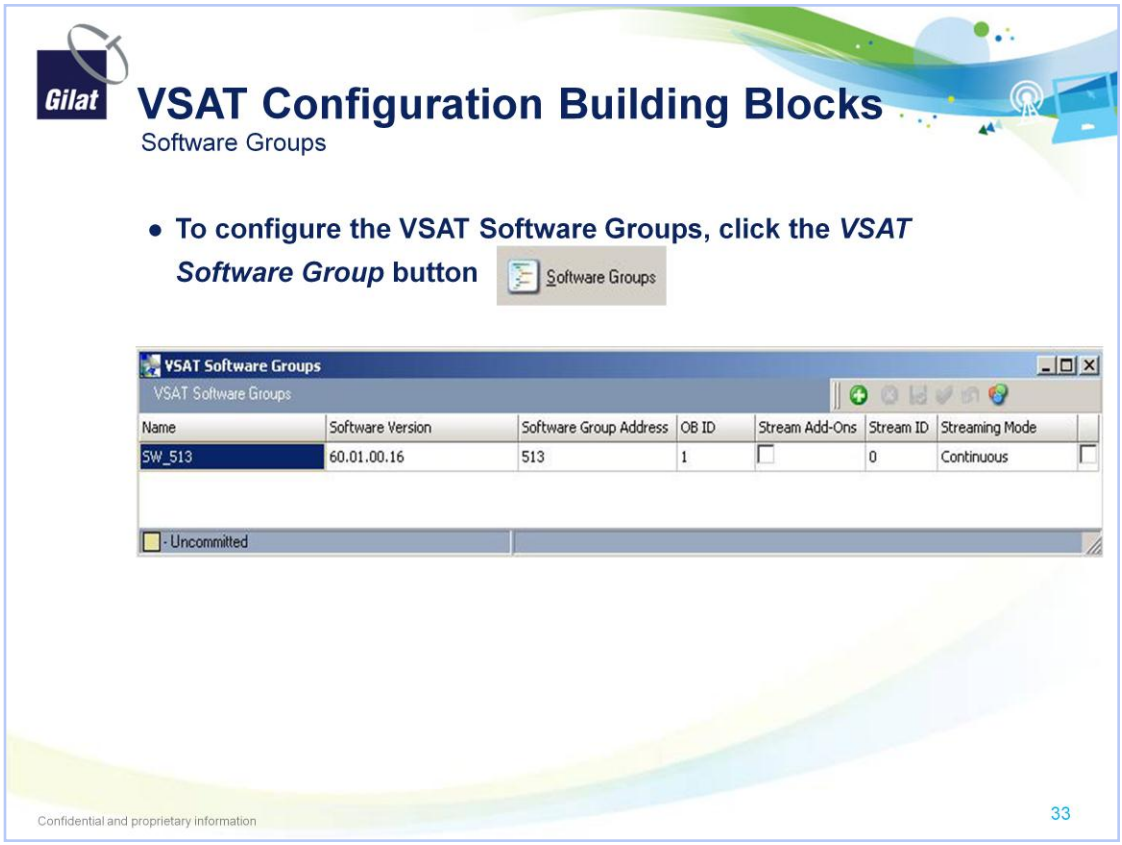
- Before configuring a VSAT on the NMS, several parameters must be pre-configured
  - VSAT Software Repository – This is a list of all available VSAT software versions
  - Templates – A set of Templates must be applied to each VSAT module
  - Software Group – A Software Group address must be applied to each VSAT software version
  - Parameters Group Address – An address that is associated with a specific RSP must be applied to each VSAT



The VSAT Software Repository window contains VSAT software versions and the software components supported by the version (RPs – Remote Processors): Access and Data.



The VSAT Templates Configuration window contains Template configuration, associated with the VSAT Software version and component type.
Only one Template of each type (Access, Data) can be specified per VSAT. The template type applicable to a VSAT is defined by the VSAT type (IP, Call, etc.).

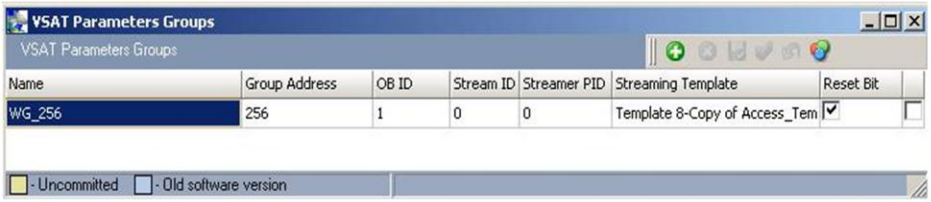


The VSAT Software Groups window contains the Software Group Address associated with every Software version. Every VSAT is configured with the Software Group Address associated with its software version. The NMS Streamer transmits software versions according to the Software Group Addresses.

VSAT Configuration Building Blocks

Parameters Groups

- To configure the VSAT Parameters Groups, click the *VSAT Parameters Groups* button 

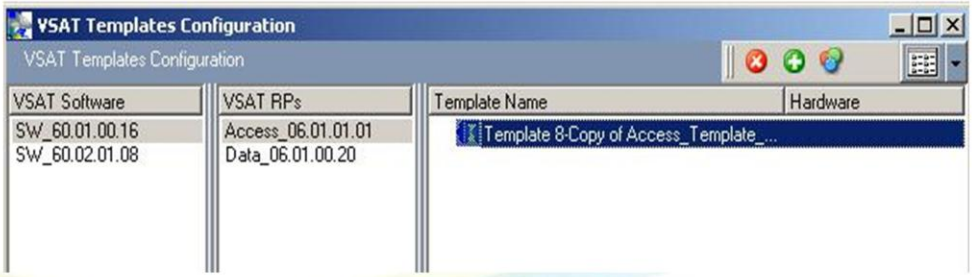


The VSAT Parameters Groups window contains Access templates associated with each Parameters Group. This address is used by the NMS Streamer to send Access Template parameters.

VSAT Configuration Building Blocks

Templates

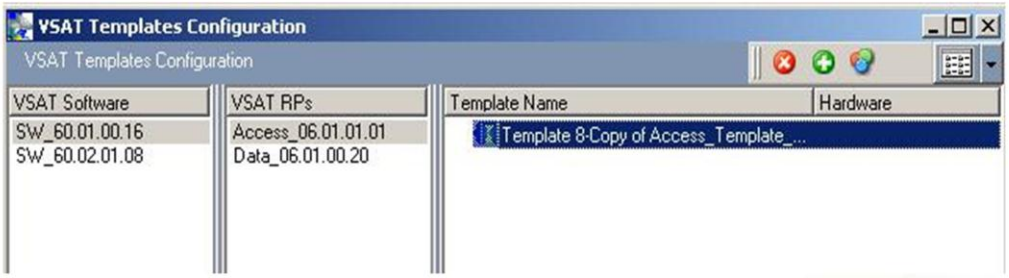
- In the SkyEdge II network, templates are used to configure VSATs
- Template parameters are configured in the specific Templates Parameters window, and then are assigned to the VSATs
- The following templates are used for VSAT configuration
- Access
- Data



Templates Configuration

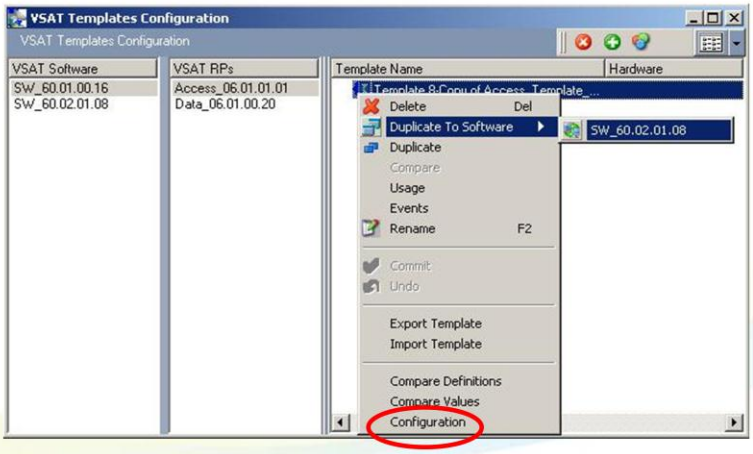
- The Template button 

in the toolbar opens the Templates' Parameters window

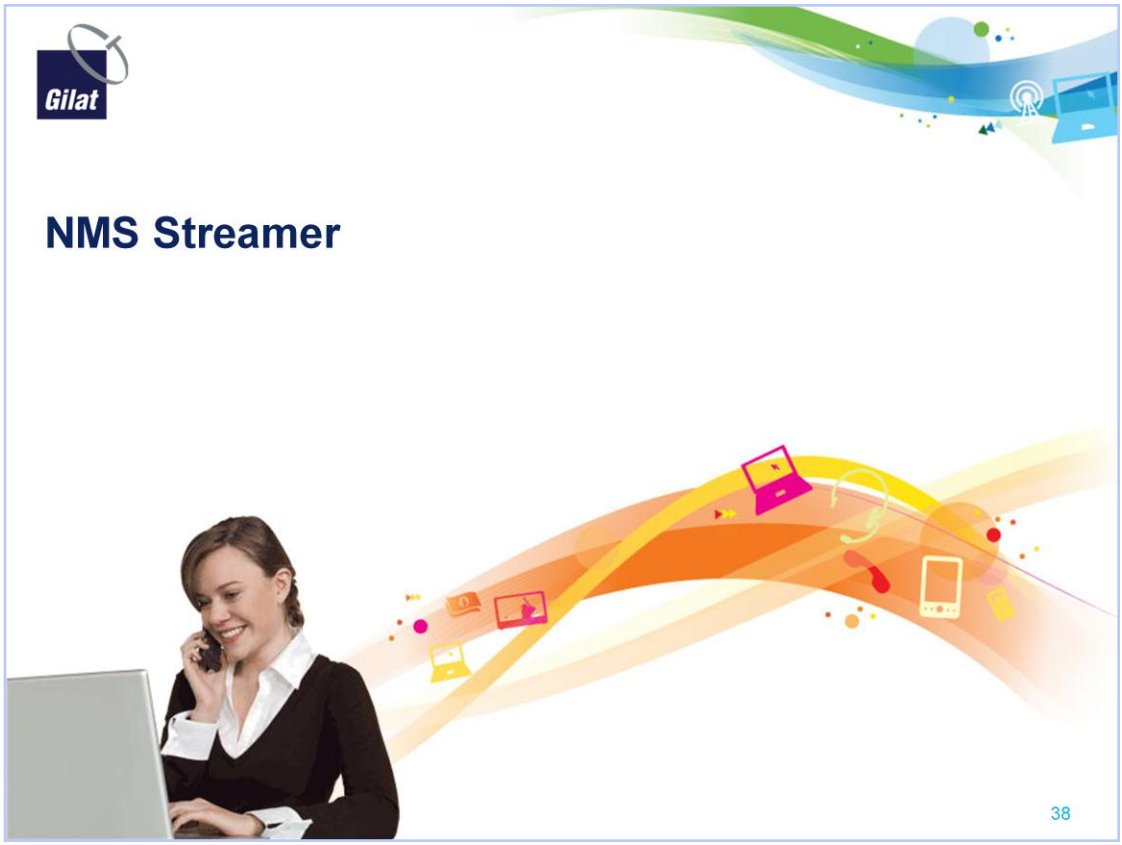


Templates Configuration (1)

- To add a new template, select the VSAT Software, VSAT RPs and click the Add button
- To display the Template Function menu, right-click the template.
- To open the Template configuration window, double-click the relevant template or right-click the template and select *Configuration*



To duplicate a template, right click the template and choose *duplicate*. If you wish to duplicate a template to other VSAT software, right click the template and chose *Duplicate to Software.*


Gilat
NMS Streamer
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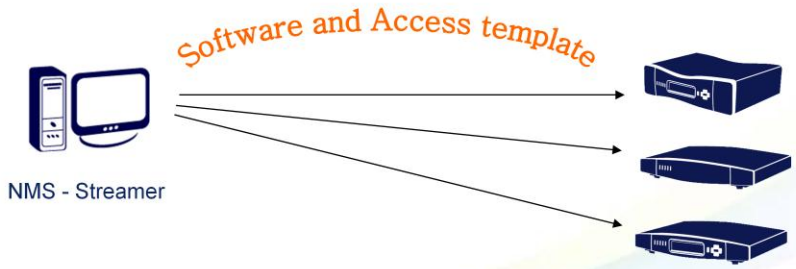
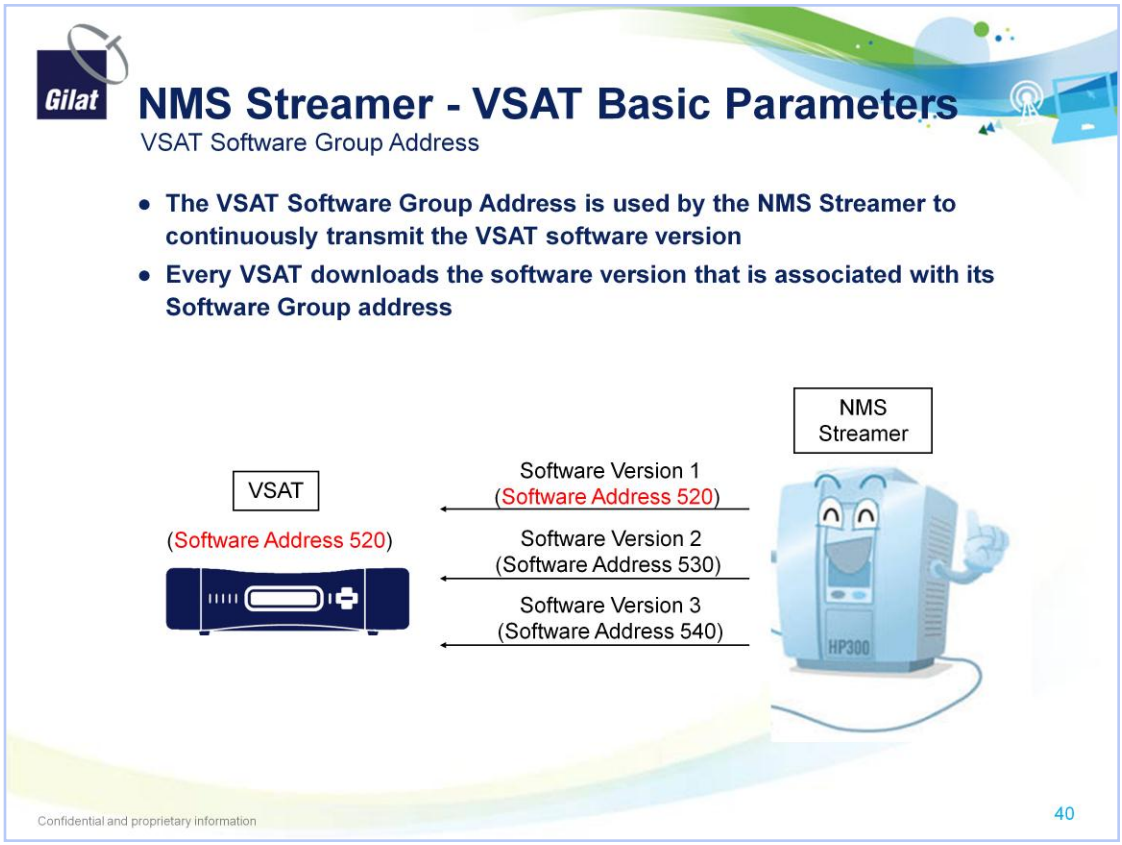
NMS Streamer

- Just as the NMS is used to manage the software versions and Access templates running on the Hub components, it also manages the software versions and access Template of the VSATs
- The NMS Streamer is a module of the NMS Server which constantly broadcasts the current Software versions and Access Templates that correspond to the different VSAT groups



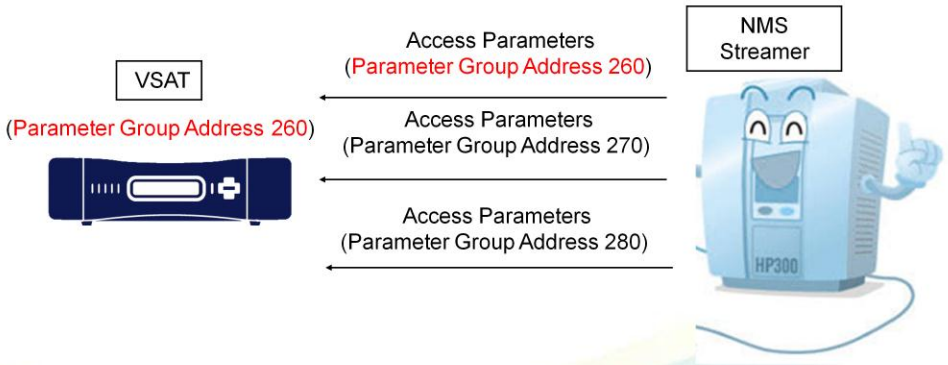


Software Address number range: 512 to 767

NMS Streamer VSAT Basic Parameters

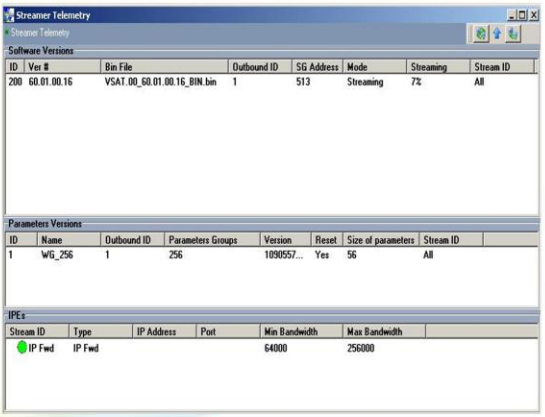
VSAT Parameters Group Address

- **The VSAT Parameters Group Address is used by the NMS Streamer to continuously transmit the VSAT Access (RSP) template**

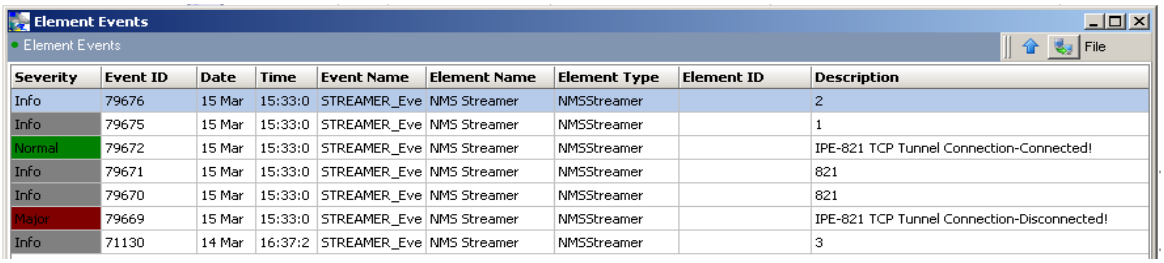


NMS Streamer

- The NMS S/W Streamer can be accessed from the NMS Server screen
- Details on its status, and what is being streamed to the VSATs can be monitored from the NMS Browser, by right clicking at the NMS Streamer icon and selecting *Telemetry > Streamer Status*



NMS Streamer related events, can also be viewed by right clicking on the NMS Streamer icon and selecting Events



Severity	Event ID	Date	Time	Event Name	Element Name	Element Type	Element ID	Description
Info	79676	15 Mar	15:33:0	STREAMER_Eve	NMS Streamer	NMSStreamer		2
Info	79675	15 Mar	15:33:0	STREAMER_Eve	NMS Streamer	NMSStreamer		1
Normal	79672	15 Mar	15:33:0	STREAMER_Eve	NMS Streamer	NMSStreamer		IPE-821 TCP Tunnel Connection-Connected!
Info	79671	15 Mar	15:33:0	STREAMER_Eve	NMS Streamer	NMSStreamer		821
Info	79670	15 Mar	15:33:0	STREAMER_Eve	NMS Streamer	NMSStreamer		821
Major	79669	15 Mar	15:33:0	STREAMER_Eve	NMS Streamer	NMSStreamer		IPE-821 TCP Tunnel Connection-Disconnected!
Info	71130	14 Mar	16:37:2	STREAMER_Eve	NMS Streamer	NMSStreamer		3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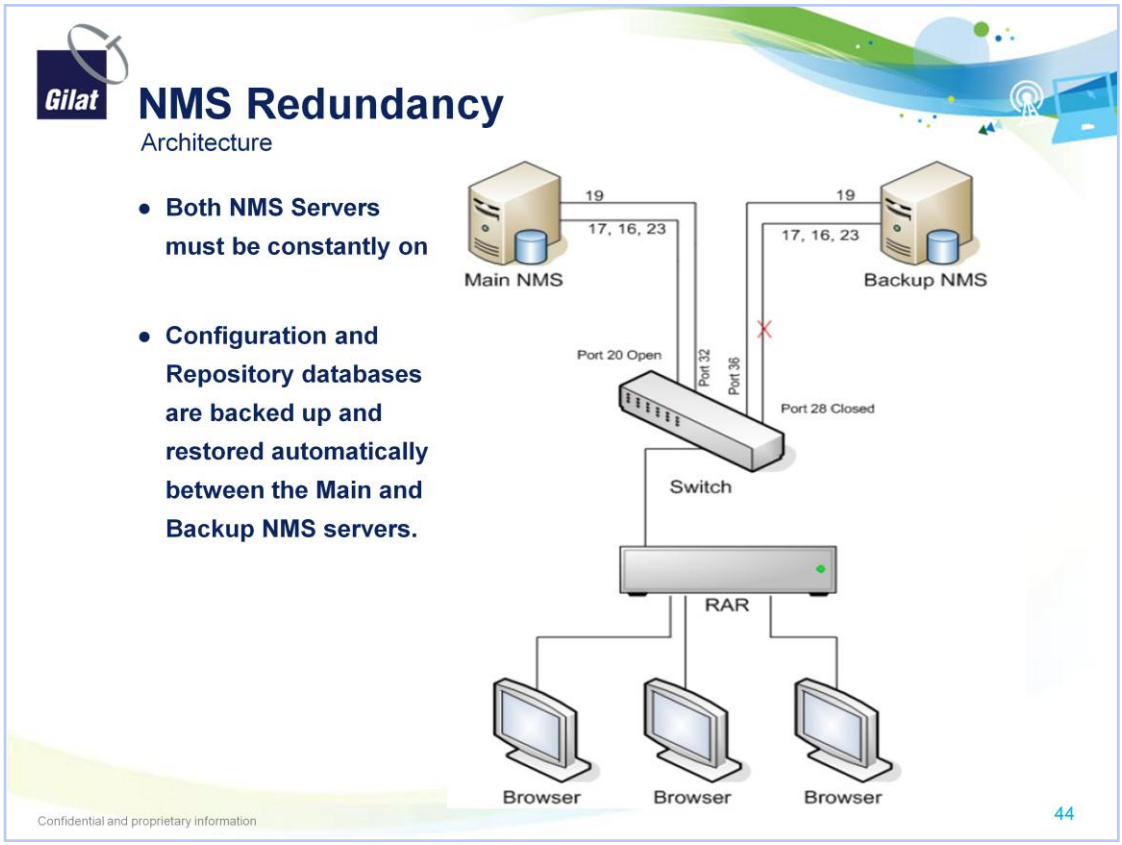


Database synchronization process:

The Main NMS Server awakens every ten minutes to check port (20/28). If the port is open, it checks when was the last time the database was restored on the Backup NMS Server. If synchronization is due, it initiates one at the proper time.

The Backup NMS Server awakens every ten minutes to check port (20/28). When it finds port 28 closed, it turns back to sleep mode. When notification from operating system regarding a file copied to the FTP directory is received, the Backup NMS Server initiates database restore. Only local browser can connect to the Backup NMS Server machine.

NMS Redundancy

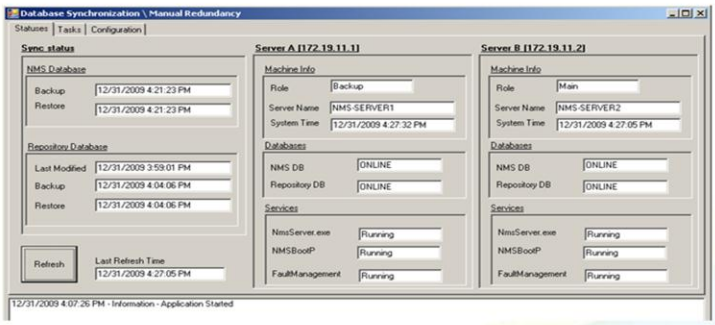
Operations

- To initiate an NMS redundancy application: *Start-> NMS-> Redundancy.exe*
- From the Redundancy application the operator can do the followings:
  - Check the Server status
  - Check the database synchronization status
  - Initiate manual database synchronization
  - Initiate server switchover
  - Synchronization scheduling
  - Suspend/Resume synchronization process

NMS Redundancy

Switchover

- Verify the NMS database Backup and Restore instances match
- Check NMS Server Status
- Under Tasks tab click , Click *Yes* on the confirmation dialog box
- Check NMS Server Status after the switch over process had finished



This slide summarize the NMS Switchover procedure, for a complete information about the NMS Redundancy application functionality please refer to Gilat Official documentation.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NMS Backup and Restore
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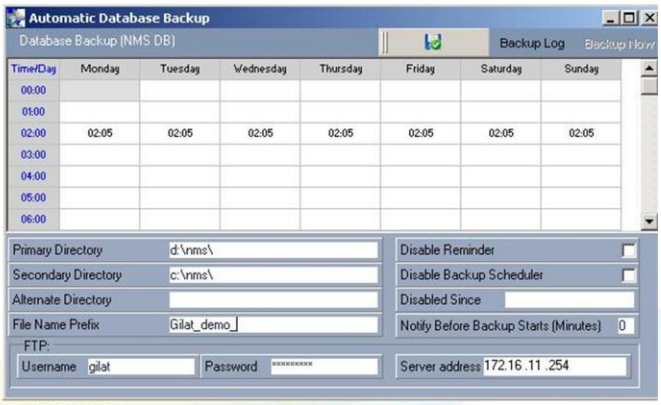
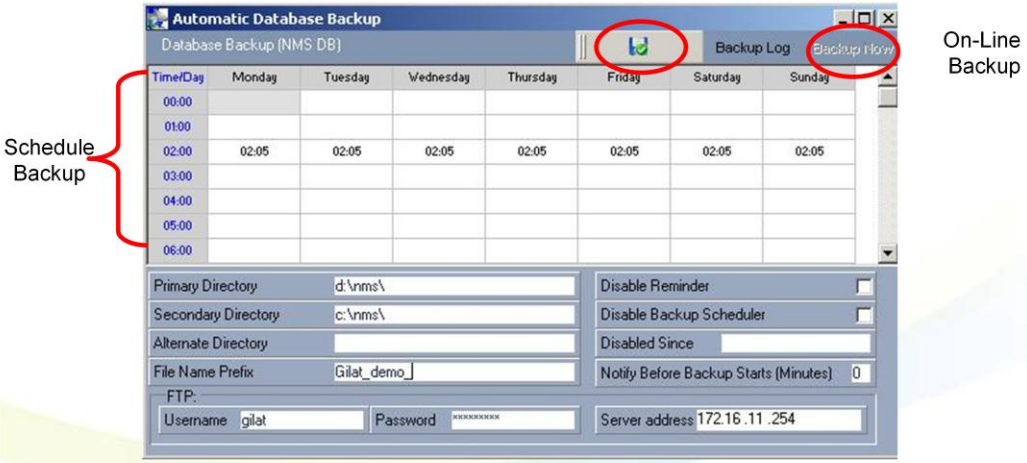
Database Backup

- The SkyEdge II NMS database can be backed-up automatically
- Binary backup (*.NBK2) can be performed while the server is running
- NMS Database can be backed-up in the following ways
  - Automatic scheduled backups
  - Manual on-line backup from NMS Browser
  - Manual on-line backup from NMS DBTools



Schedule And On-Line Backup

- The Database Backup icon  on the NMS Browser tool bar menu opens the Automatic Database Backup window



To configure Automatic scheduled backup, enter only minutes at the chosen day and hour. For example, if you wish to schedule a backup at 02:05 every day, enter only 05 at appropriate place, and save your configuration.

To do an immediate backup, press the *Backup Now* Button.

Every Backup can be saved in 2 locations: *Primary directory* and *secondary directory.* If one of the configured directories is not available, the *Alternate directory* will be used. When configuring an FTP username, Password and IP address, the Backup file will be copied to the FTP server as well as to the primary and secondary directories.

NMS DBTools Utility Functions

- The NMS DBTools utility enables you to perform the following operations
  - Backup NMS database files
  - Restore NMS database files
  - Build and upgrade NMS database structures
  - Delete the NMS database contents
- When performing the NMS backup, it is not necessary to close the NMS Server and NMS Browser. When performing all other operations using the DBTools, the NMS Server and NMS Browser must be closed

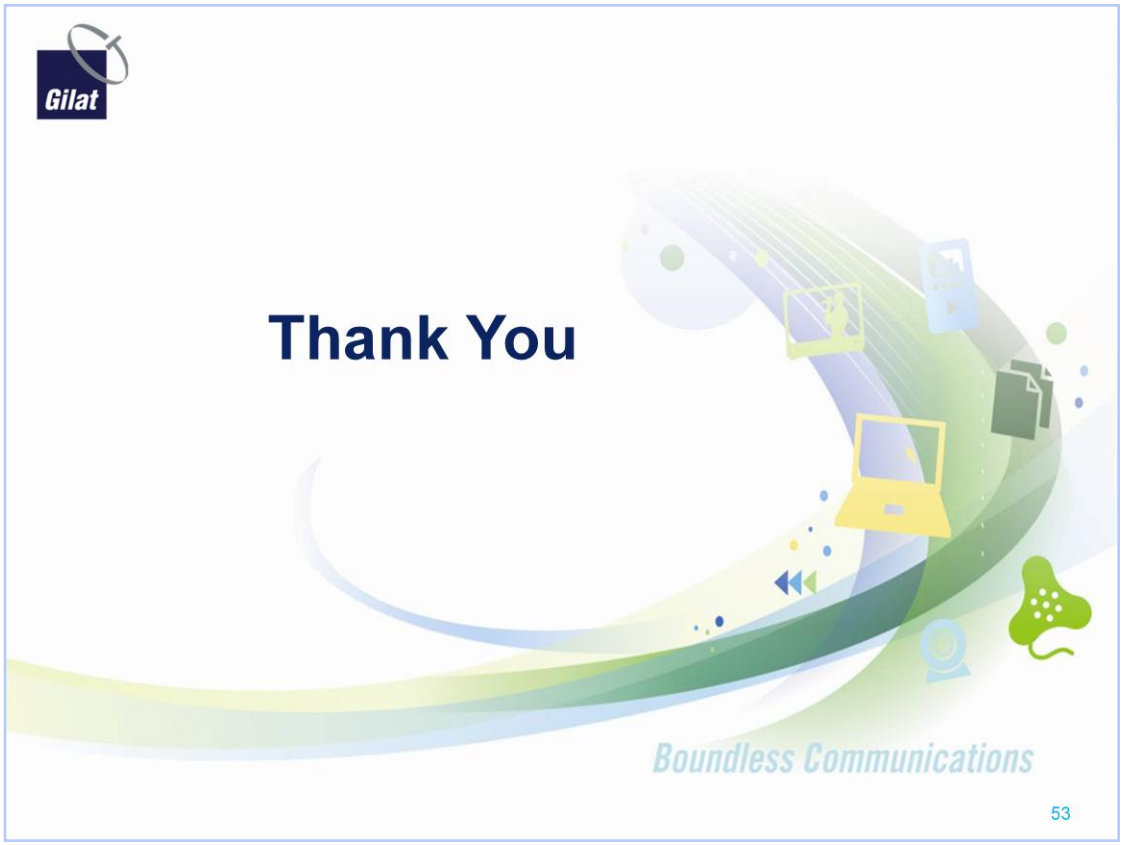
NMS DBTools Utility

- To activate the *NMSDBTools* utility, click *Start* and select *NMS→NMSDBTools.exe*

NMS DBTools Utility (ctd.)

- The main NMS DBTools window, gives access to all its functions
- Common DB Functions
  - Backup
  - Restore

The other DB functions are reserved to Gilat technical support personnel.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Thank You
Boundless Communications
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