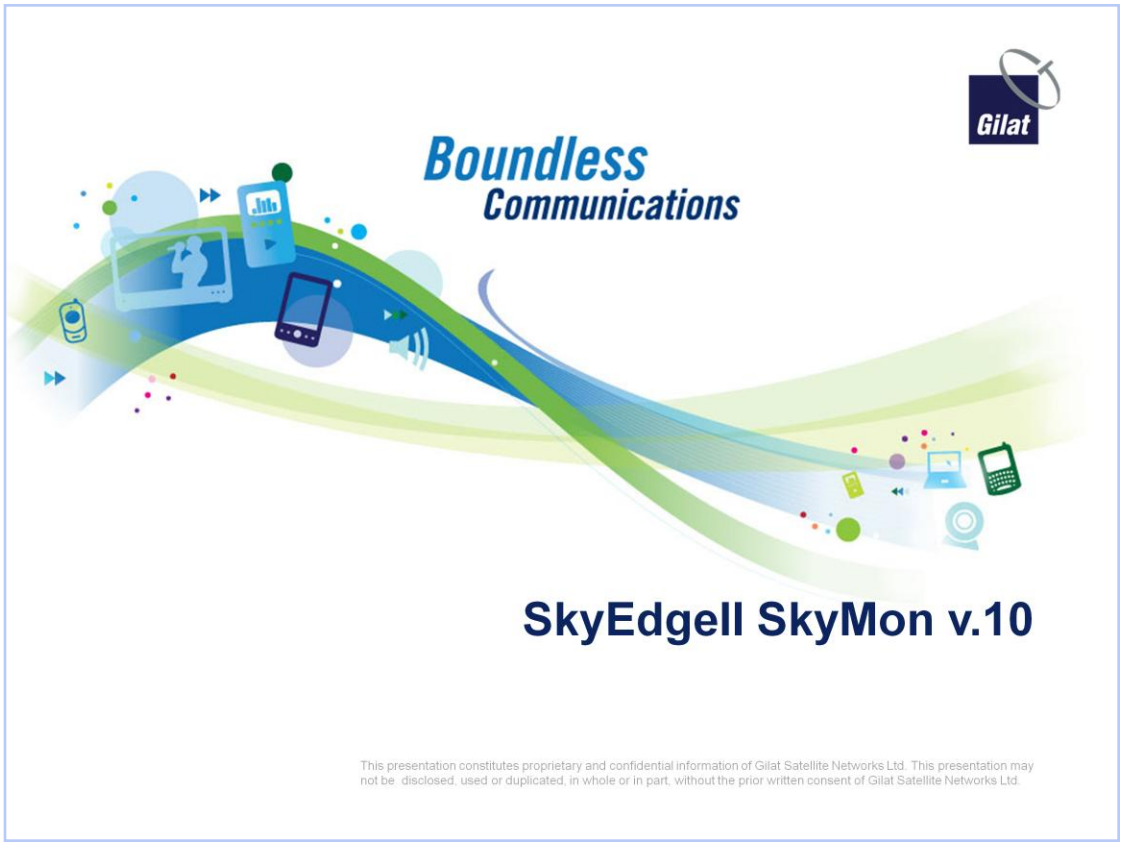
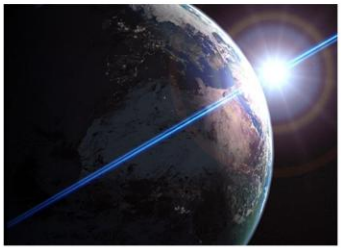
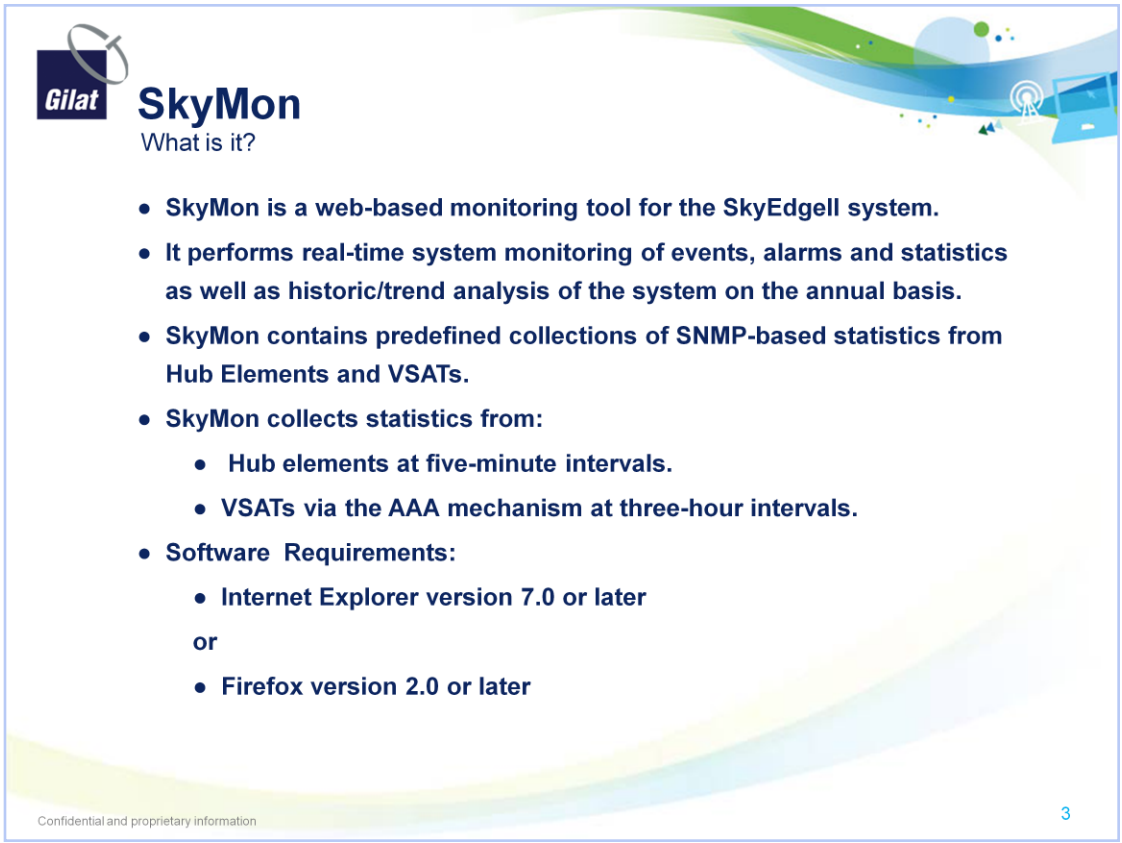


Agenda

- What is SkyMon?
  - Log in Procedure
- Dashboard
  - Home Tab
  - Additional Tabs
- Monitor
  - Hub Elements, Events and Alarms
- Reports and Graphs Examples



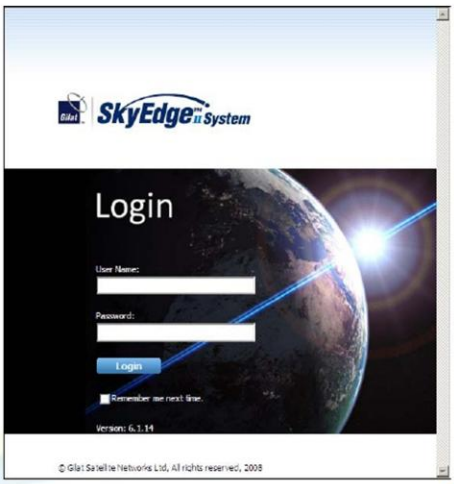


Starting from version 6.1 a new monitoring tool is added to the SkyEdge II portfolio – SkyMon. SkyMon is a web-based monitoring tool for the SkyEdge II system. It performs real-time system monitoring of events, alarms and statistics as well as historic/trend analysis of the system over a one year period. SkyMon collects statistics from Hub Elements and VSATs (via the AAA mechanism). SkyMon also synchronizes periodically with the NMS in order to receive the network topology and events available at the NMS. SkyMon contains pre-defined collections of SNMP-based statistics received from Hub elements and VSATs. These collections have been defined based on Gilat's long time experience in network monitoring. The collections include all information required for monitoring and debugging a satellite communication network.
Users can generate real time and historic reports based on the collected information using a friendly web-based GUI – designed especially for satellite communication network operators.
One of the main SkyMon advantages is its innovative capability – Dashboard; based on the latest web technology from Microsoft, the Dashboard is a user defined screen. Users can design a web page according to their needs – create as many tabs as they want; in each tab they can add any information that is available to the system : real-time graphs, historic reports, events table, alarms table, network elements table, summary display of events and alarms etc. Each information type is available as a web part that can be placed any where in the GUI. Each user can create his/her own information display. SkyMon automatically saves information for each user.

SkyMon

Log in to SkyMon

- **Open a Web Browser**
  - **Type SkyMon IP address**
  - **The SkyMon login window is displayed:**
    - User Name: ***admin***
    - Password field: ***admin***



4

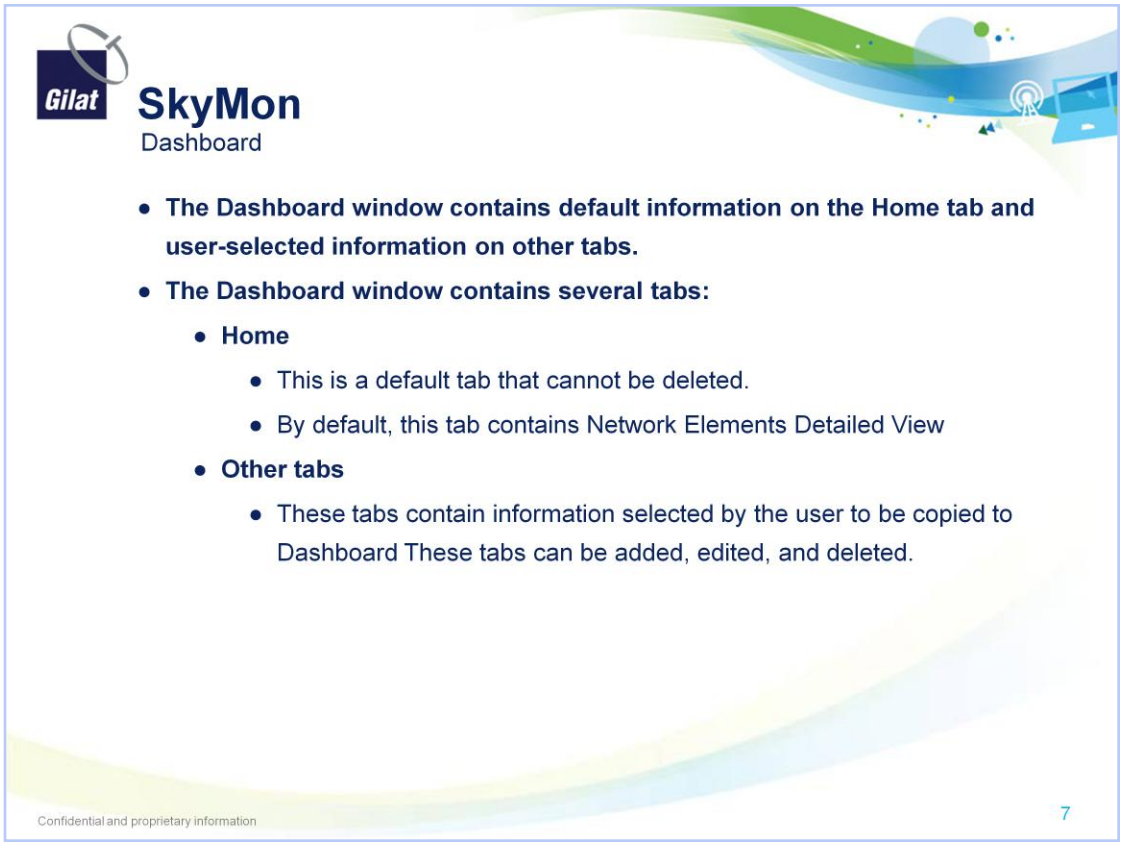
Make sure that there are no Proxy configuration in the Browser.
The default user name and password are used only when first logging on to the system. Additional user accounts must be created.

SkyMon

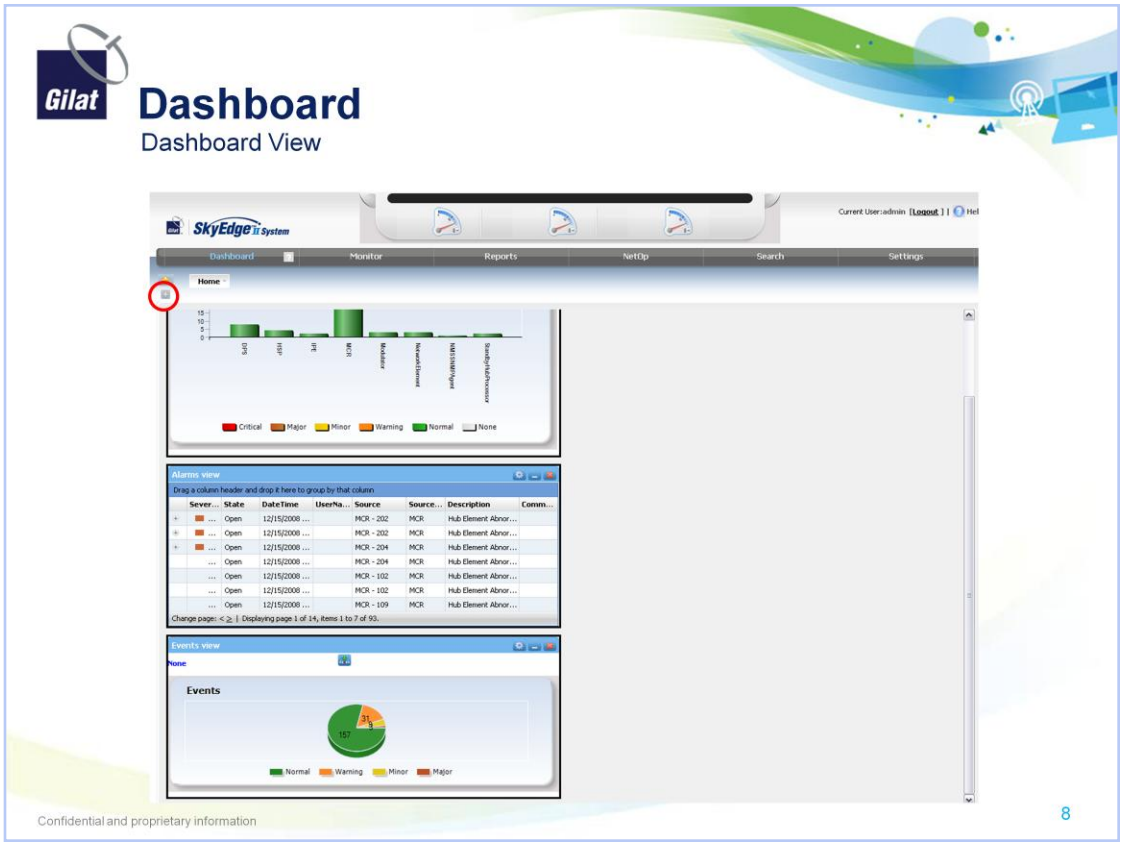
Component Toolbar

- **Dashboard -** Provides information selected by the user. The user can customize this page.
- **Monitor -** Displayed the status of network elements.
- **Reports -** Displays existing reports and provides access to the Report Builder.
- **Search -** Opens the SkyMon search utility.
- **Settings -** Displays data about SkyMon users and a panel from which NMS synchronization actions can be performed.


Gilat
Dashboard
6

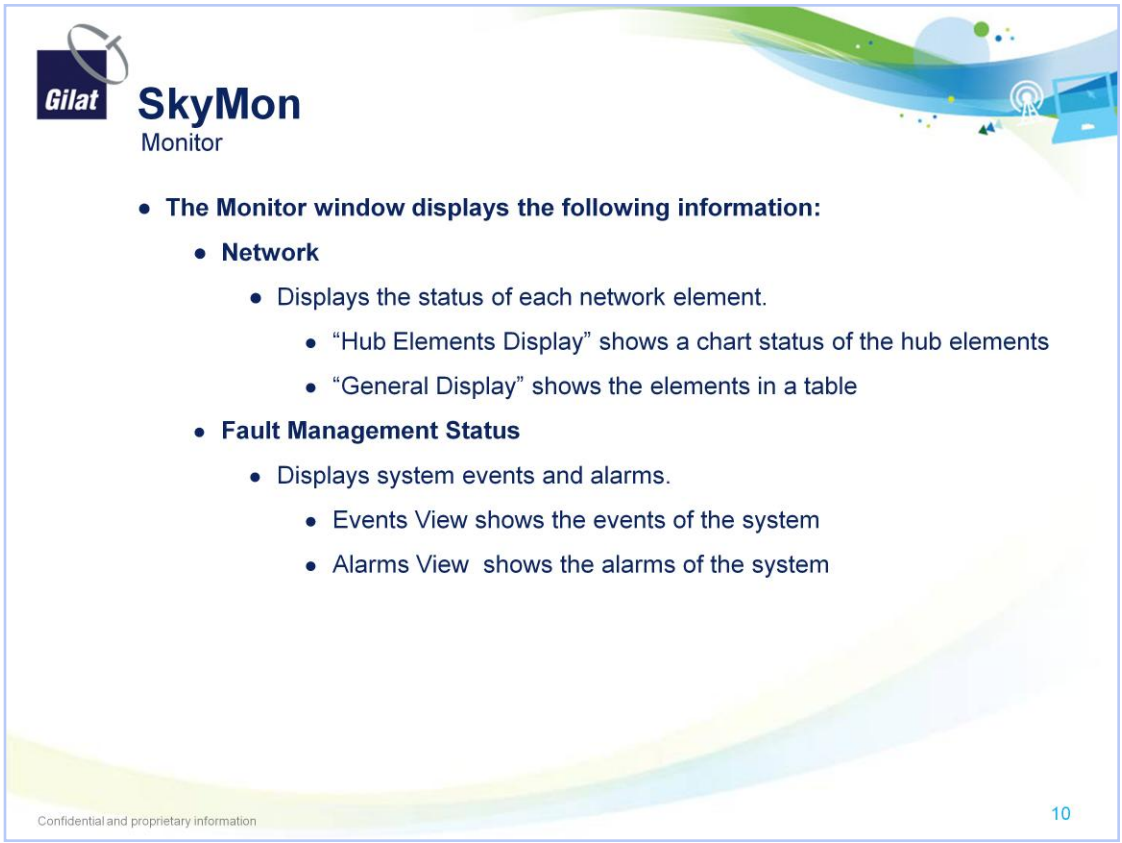


The Dashboard has the Home Tab which contains by default Network Elements Detailed View, Events, and Alarms. Additional Tabs can be opened by the User.



Click on the “plus” sign to add more tabs


Gilat
Monitor
9


Gilat
SkyMon
Monitor
The Monitor window displays the following information:
Network
Displays the status of each network element.
"Hub Elements Display" shows a chart status of the hub elements
"General Display" shows the elements in a table
Fault Management Status
Displays system events and alarms.
Events View shows the events of the system
Alarms View shows the alarms of the system
Confidential and proprietary information
10

SkyMon

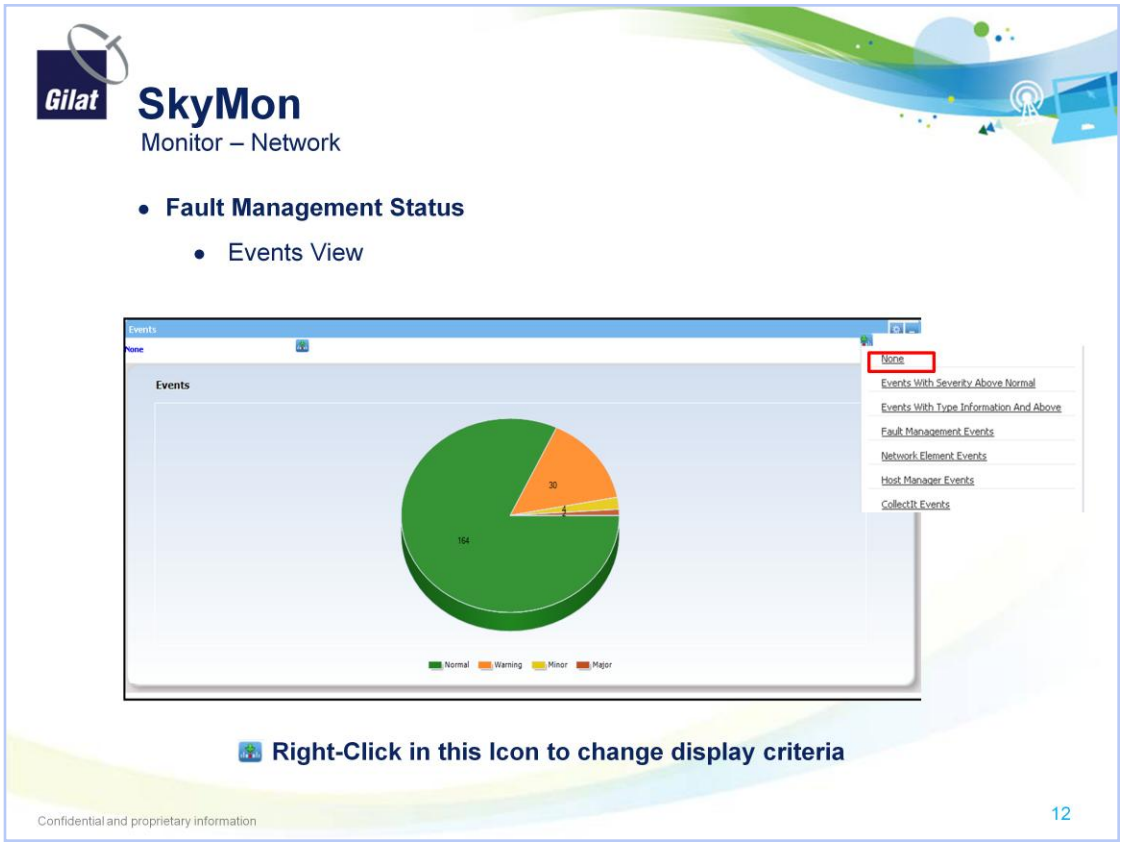
Monitor – Network

- **Network Elements**
  - Hub Elements Display

Click in this Icon to change views

By clicking on the “Tool Icon” it is possible to choose the following:
• “General Display” - A table view will be shown.
• “Hub Element Display” - A Graphical view will be shown.
• “VSAT View” - Not available in this version.

The status display is color-coded as follows:
•Critical - Red
• Major fault - Brown
• Minor fault - Yellow
• Maroon - Warning
• Green - Normal
• Grey - None



Events can be displayed according to the following criteria:
- None
- Events With Severity Above Normal
- Events With Type Information And Above
- Fault Management Events
- Network Element Events
- Host Manager Events
- CollectIt Events


Gilat
Reports and Graphs
13


Gilat
SkyMon
Reports
Events
AAA Receive Report
Any Event Report
Event Occurrence per Resource Type Report
Event Occurrence Report
Link Connect Report
Link Disconnect Report
System
CSC HEC Report
VSAT Coordinates Report
VSATs Auto Pointing
Installation Report
Confidential and proprietary information
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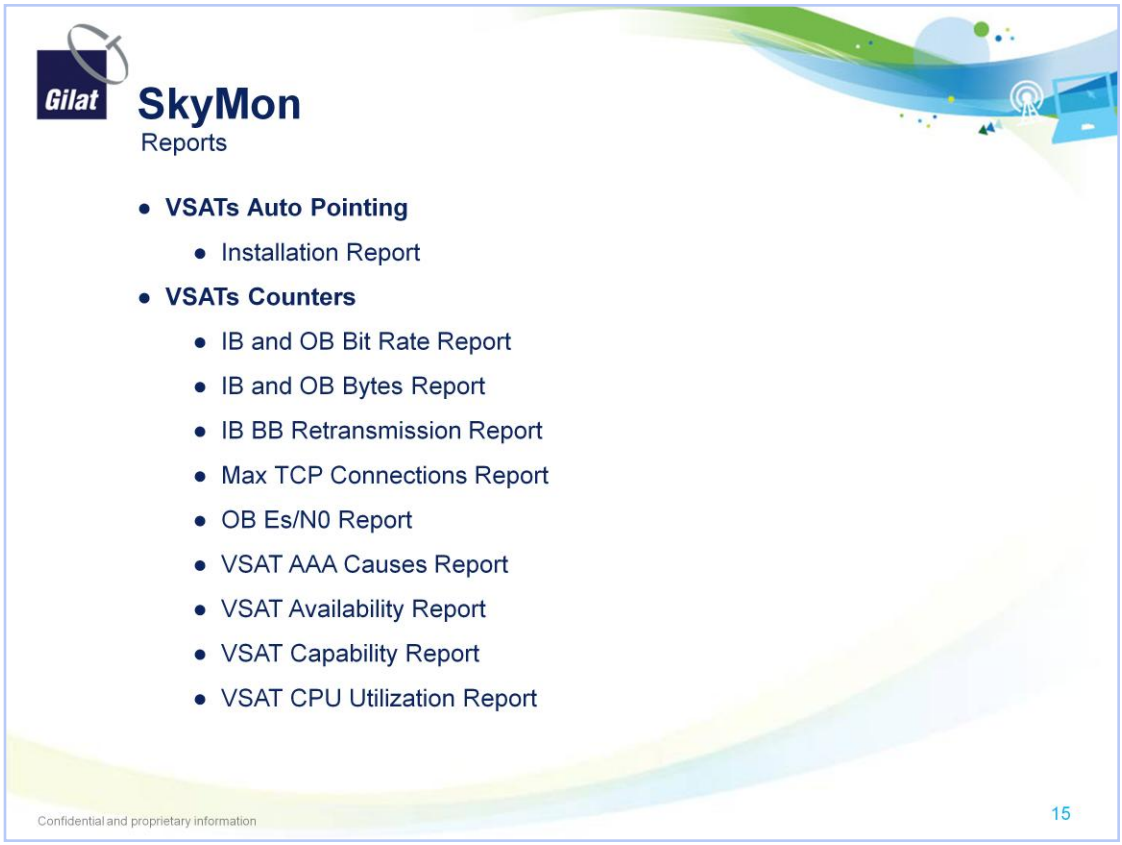
Gilat
SkyMon
Reports
VSATs Auto Pointing
Installation Report
VSATs Counters
IB and OB Bit Rate Report
IB and OB Bytes Report
IB BB Retransmission Report
Max TCP Connections Report
OB Es/N0 Report
VSAT AAA Causes Report
VSAT Availability Report
VSAT Capability Report
VSAT CPU Utilization Report
Confidential and proprietary information
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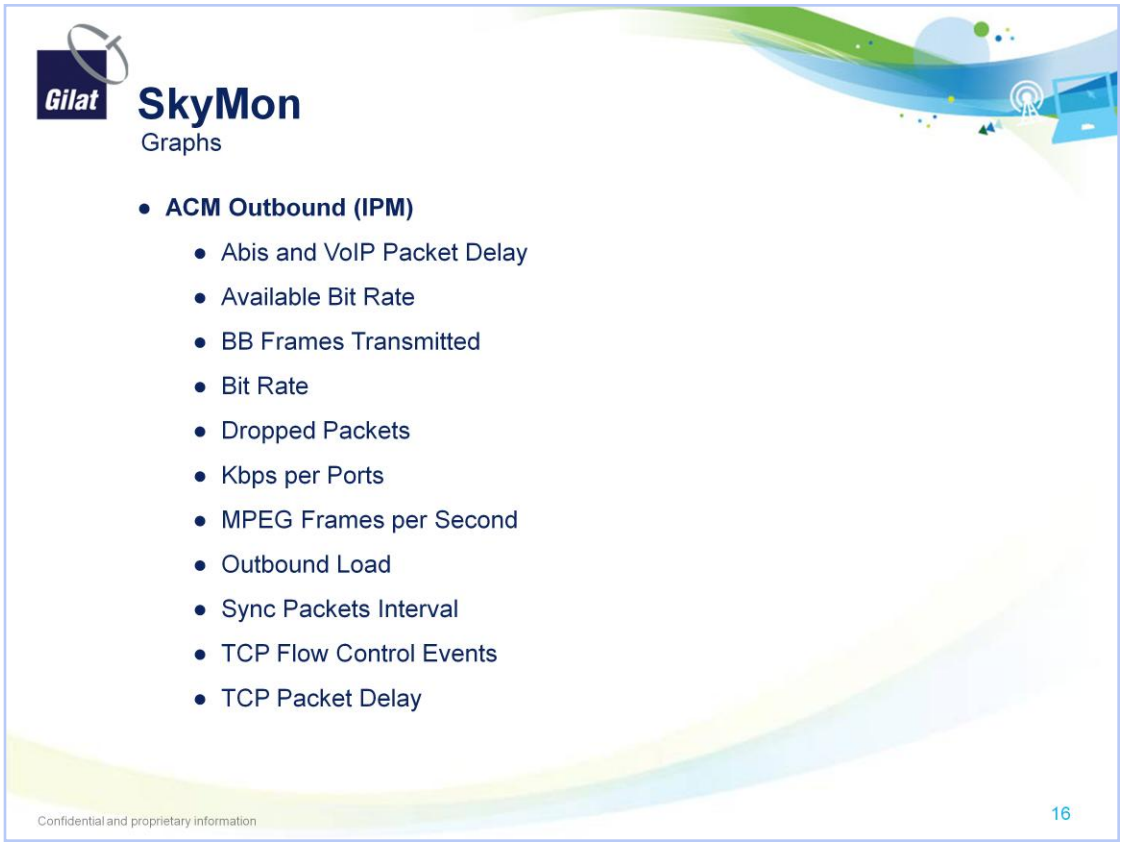
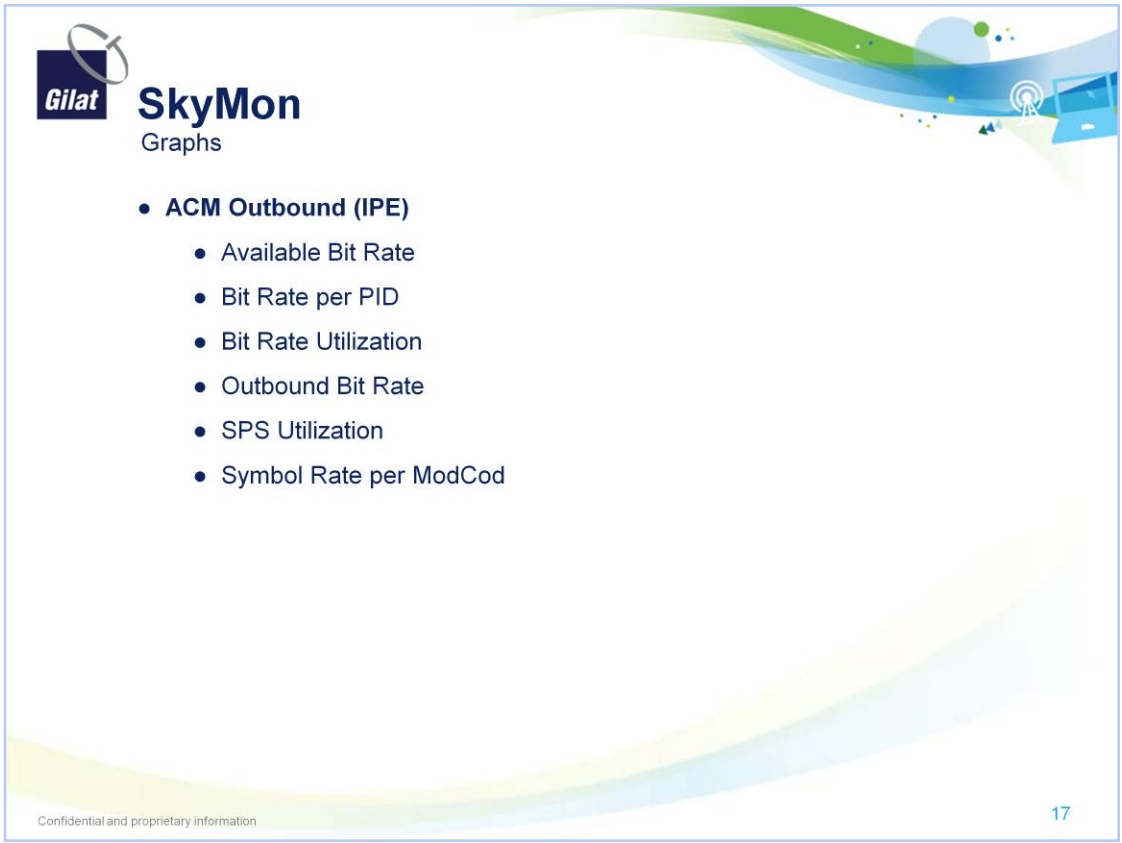
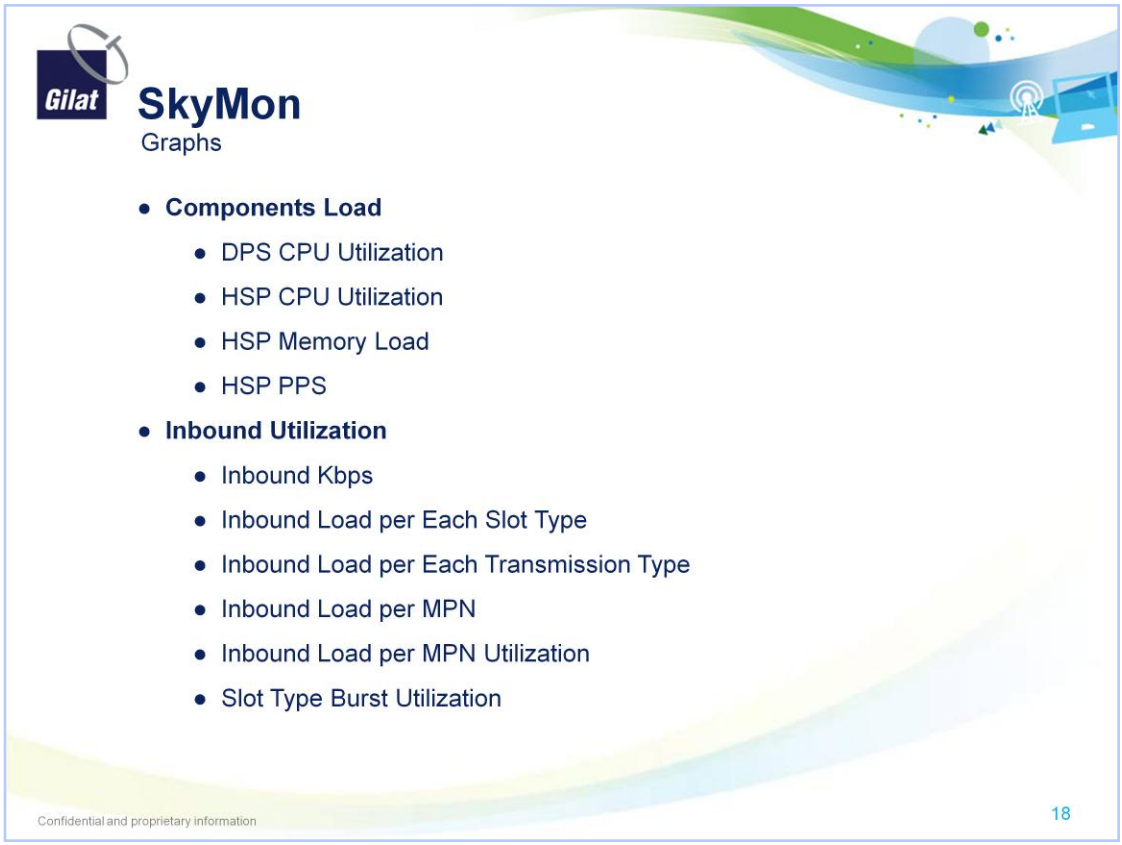


This will be found in systems using IPM



This will be found in systems using IPE and Modulator


Gilat
SkyMon
Graphs
Components Load
DPS CPU Utilization
HSP CPU Utilization
HSP Memory Load
HSP PPS
Inbound Utilization
Inbound Kbps
Inbound Load per Each Slot Type
Inbound Load per Each Transmission Type
Inbound Load per MPN
Inbound Load per MPN Utilization
Slot Type Burst Utilization
Confidential and proprietary information
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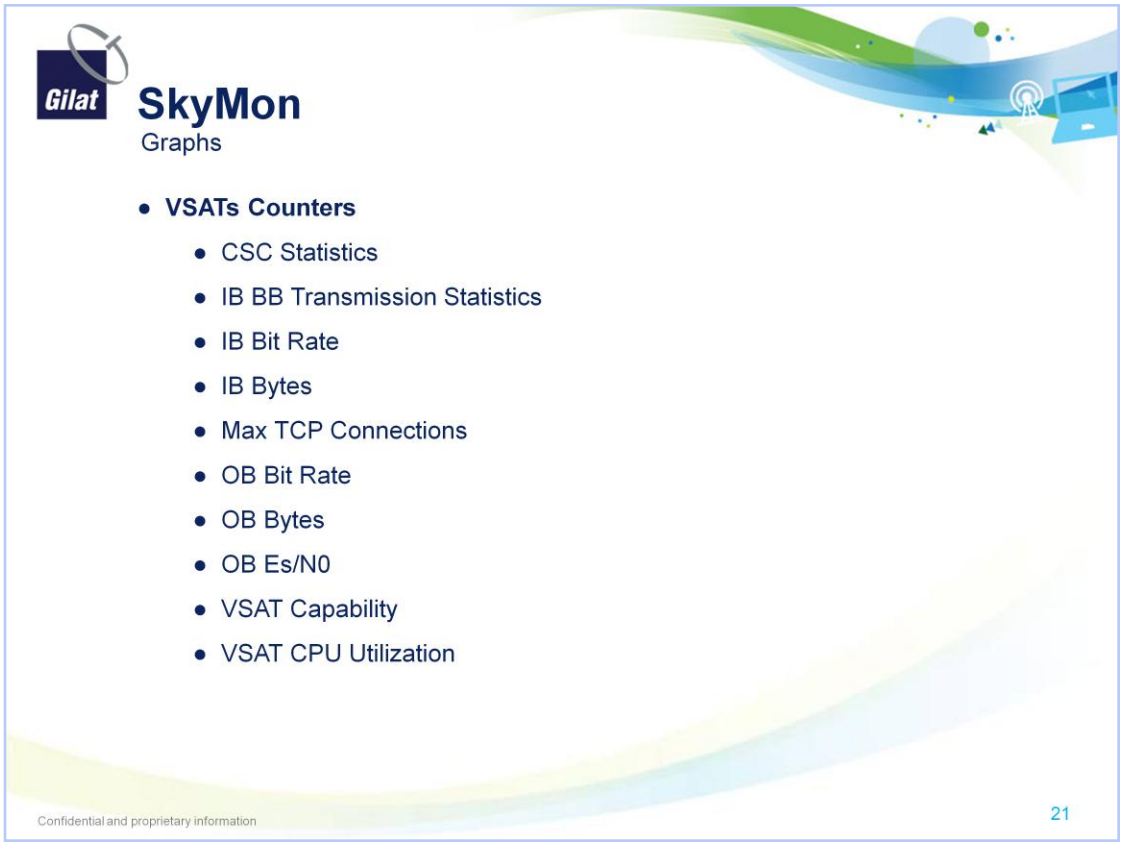
SkyMon
Graphs

- **Maintenance**
  - Inbound Backbone Retransmission (DPS)
  - Link Connection Cause (HSP)
  - Reason AC Denied per MPN and HSP
- **MCR**
  - MCR IB Noise Floor
  - MCR OB SNR
- **Outbound ModCod Analyzing**
  - Number of VSATs per Outbound ModCod (HSP)
  - Outbound Backbone Retransmissions
  - Outbound Backbone Retransmissions per ModCod
  - Outbound Kbps
  - Outbound ModCod bps

SkyMon
Graphs

- **TCP/IP**
  - Inbound IP Distribution [PPS]
  - Outbound IP Distribution [Kbps]
  - Outbound IP Distribution [PPS]
  - Star Inbound IP Distribution [Kbps]
  - TCP Connections


Gilat
SkyMon
Graphs
VSATs Counters
CSC Statistics
IB BB Transmission Statistics
IB Bit Rate
IB Bytes
Max TCP Connections
OB Bit Rate
OB Bytes
OB Es/N0
VSAT Capability
VSAT CPU Utilization
Confidential and proprietary information
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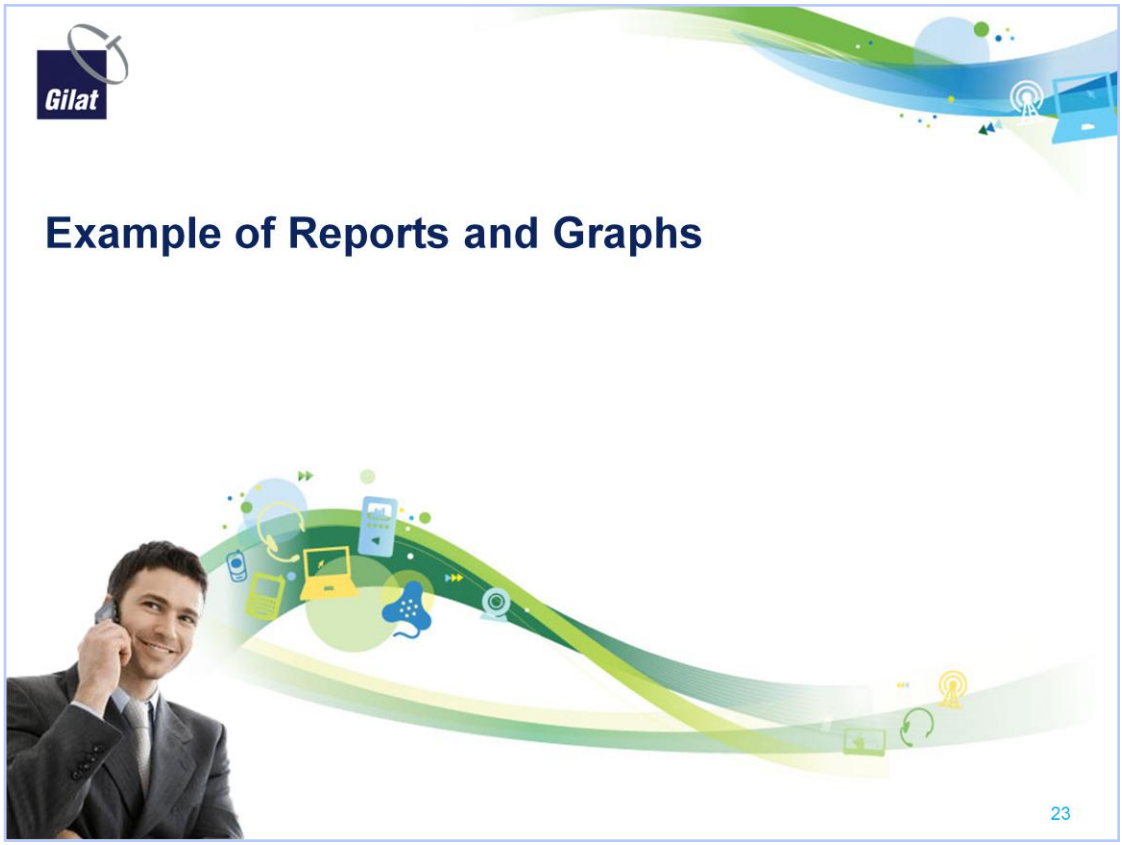
SkyMon
Graphs

- **VSAT Information**
  - VSAT OB Es/N0
  - VSAT Throughput
  - VSAT Tx Capability C/N
  - VSATs Ping
  - VSATs per Inbound Slot Type
  - Number of VSATs per Inbound Slot Type (HSP)
  - VSATs Online


Gilat
Example of Reports and Graphs
23

SkyMon

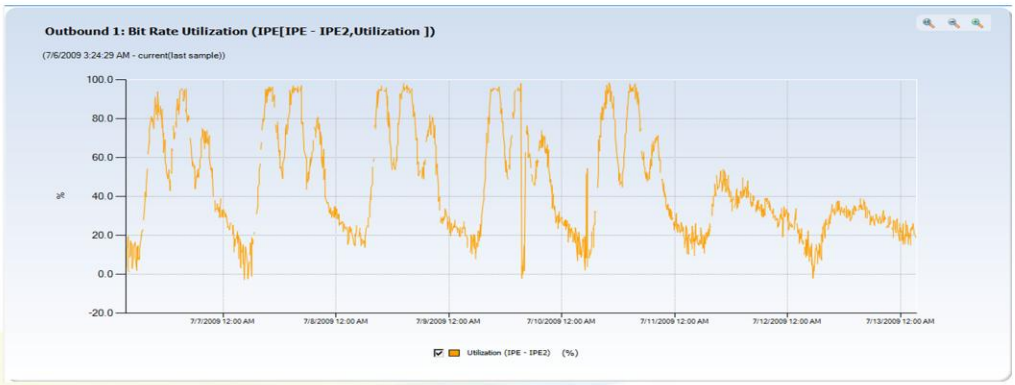
Available Bit Rate

- **Available bit rate is the total bit rate that the IPM/IPE can transmit over the Outbound.**
- **What do you see?**

SkyMon

Bit Rate Utilization

- **The Outbound Bit Rate Utilization graph displays the amount of Outbound usage.**
- **What do you see?**



The Bit Rate Utilization (IPE) report displays the delta between the used IPE bit rate and the available IPE bit rate over the period of time covered by the graph. A separate graph is provided for each Outbound. The formula is: used data (divided by available bit rate) multiplied by a 100.

Gilat

SkyMon

HSP CPU Utilization

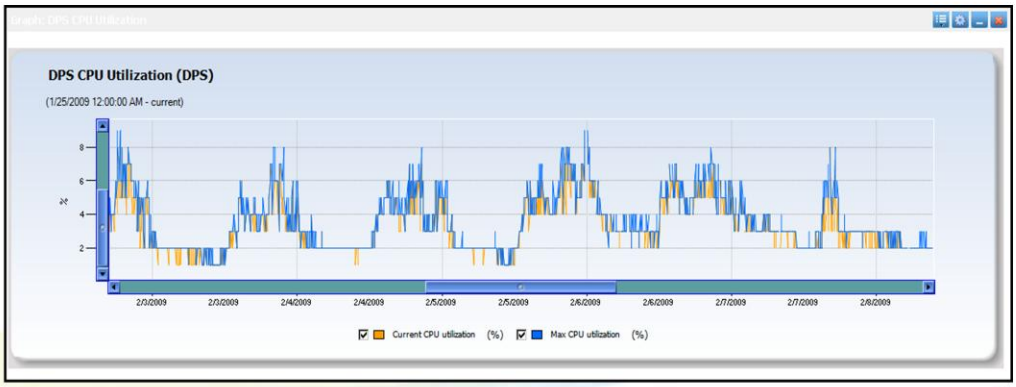
- **What do you see?**

In this Graph it can be seen that the maximum utilization of the HSP did not pass 3%.

SkyMon

DPS CPU Utilization

- What do you see?



The utilization of this DPS does not pass 8% on the specific period of time.

SkyMon

Inbound Kbps (HSP)

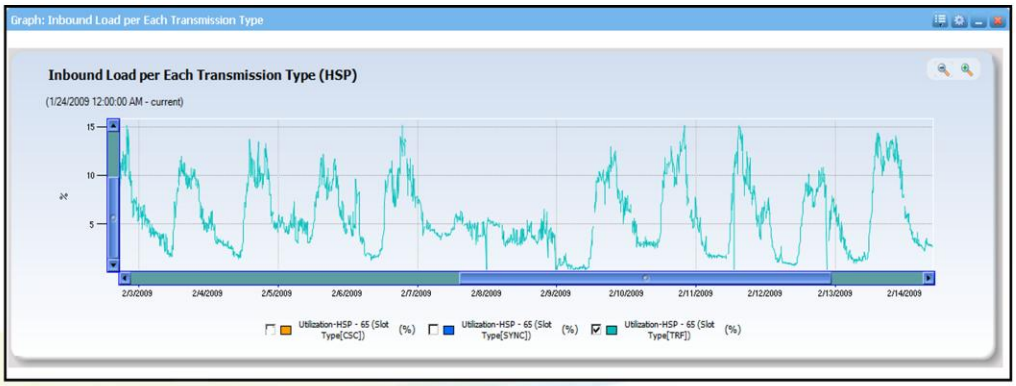
- **Indicates the amount of traffic received by the HSP**
- **What do you see?**

In a network with low traffic load and without MPN limitation, the bit rate of the requested and received traffic should be equal.
In this examples they are equal.

SkyMon

Inbound Load per each Transmission Type

- **Utilization on each slot type for each HSP configured in the system.**
- **What do you see?**



Sync utilization should be less than 95%.

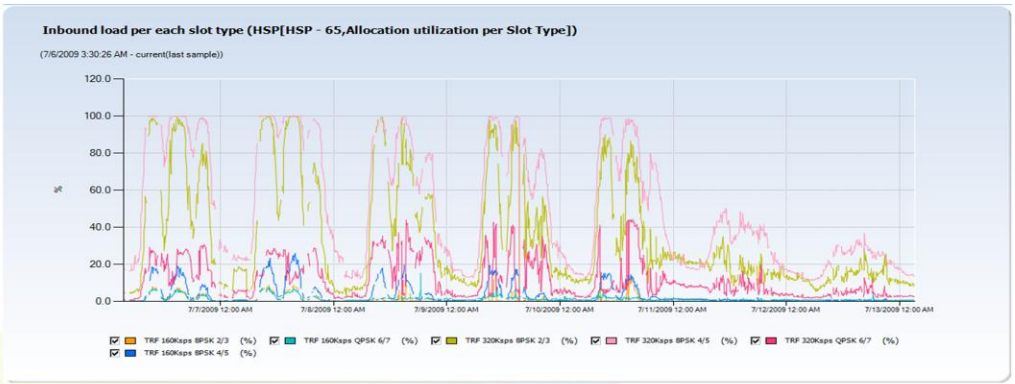
CSC utilization should be less than 40%.

If TRF utilization is more than 95%, it may indicate a problem and the Inbound Load per MPN (HSP) graph should be used for further investigation.

SkyMon

Inbound Load per each Slot type

- **Traffic load on each slot type for each HSP configured in the system.**
- **What do you see?**



SkyMon

The Inbound Load per MPN (HSP)

- **What do you see?**

AC (Admission Control) Bit Rate - Bit rate for Voice and real-time applications.

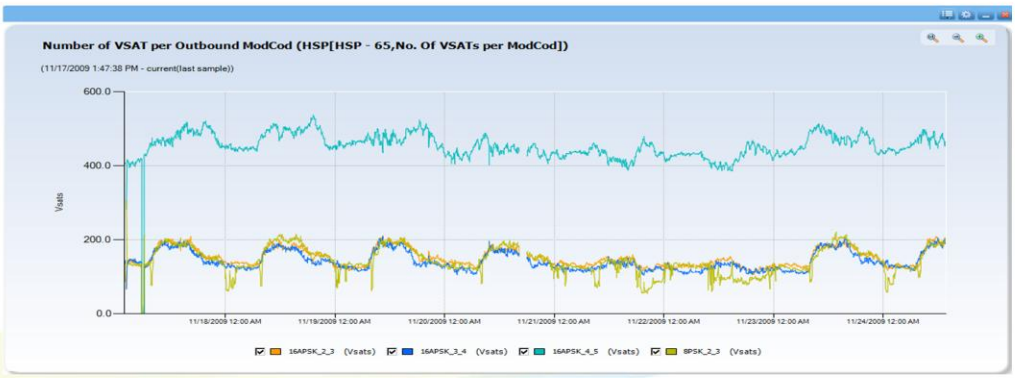
- Request ABS - Bit rate that the HSP must provide to VSATs of the specific MPN. This includes the AC bit rate plus the minimum bit rate request from all VSATs (VSAT CIR). This parameter is configured in the VSAT.
- Overall Requests - Amount of bit rate requests received from all VSAT QoS classes including FlyWheel request.
- Data Demand - Amount of bit rate requests received from all VSAT Qos without FlyWheel requests.
- Allocated - Bit rate that was allocated to all VSATs of the specific MPN.
- MPN CIR - Minimum bit rate the MPN should receive. This parameter is configured in the HSP.
- MPN MIR - Maximum bit rate the MPN should receive. This parameter is configured in the HSP.
- HSP Utilization - Percent calculated as (bit rate received by the HSP) divided by (bit rate allocated by the HSP) times*100%.

The absolute request (Request ABS) bit rate should be lower than the Allocated bit rate. If the absolute request bit rate is higher, it indicates that the VSAT did not receive the minimum required bit rate. It may mean that more space segment is needed. The delta between the absolute request bit rate and the Allocated bit rate represents the network QoS.

SkyMon

Number of VSATs per Outbound MODCOD (HSP)

- **Shows the number of VSATs that work on each ModCod configured in the HSP**
- **What do you see?**



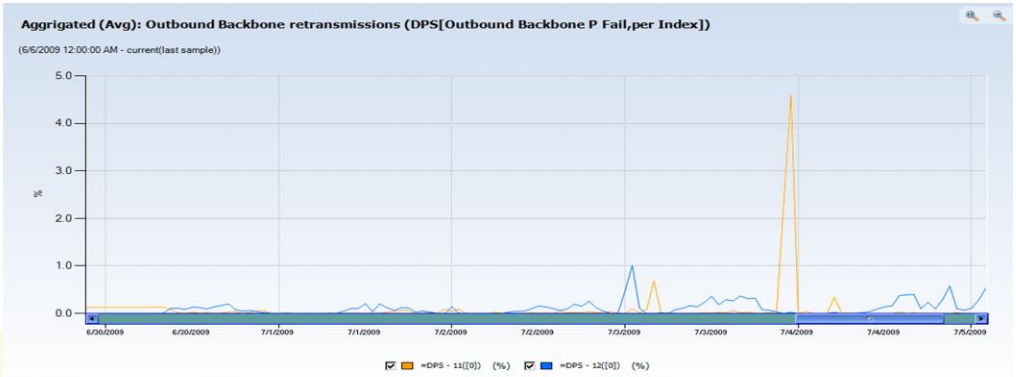
All of the VSATs configured on the HSP should be able to work in the most robust MODCOD.

We expect to see the highest possible number of VSATs to be able of working on the most efficient MODCOD.

SkyMon

OB Backbone Retransmissions (DPS)

- **Shows number of Backbone packet retransmitted**
- **What do you see?**

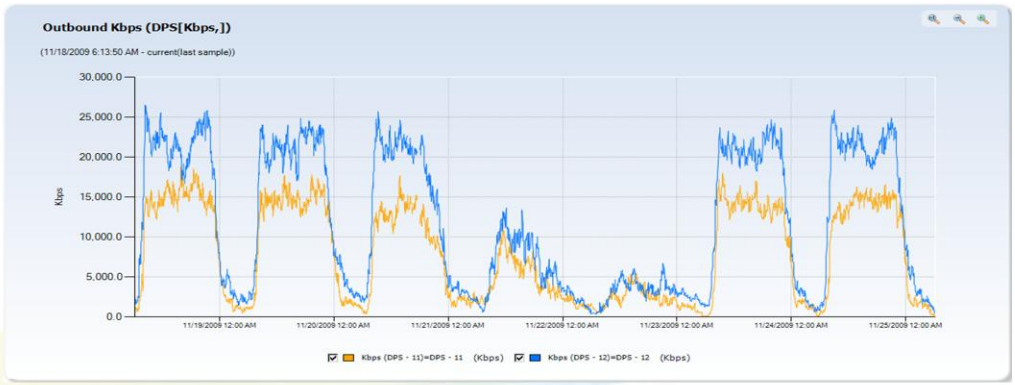


Backbone retries % = (Number of backbone packets transmitted for the second time) divided by the (Total number of Backbone packets transmitted) times*100%.

SkyMon

Outbound Kbps (DPS)

- **Shows the data transmission rate in Kbps per each DPS in the system during the specified period.**
- **What do you see?**

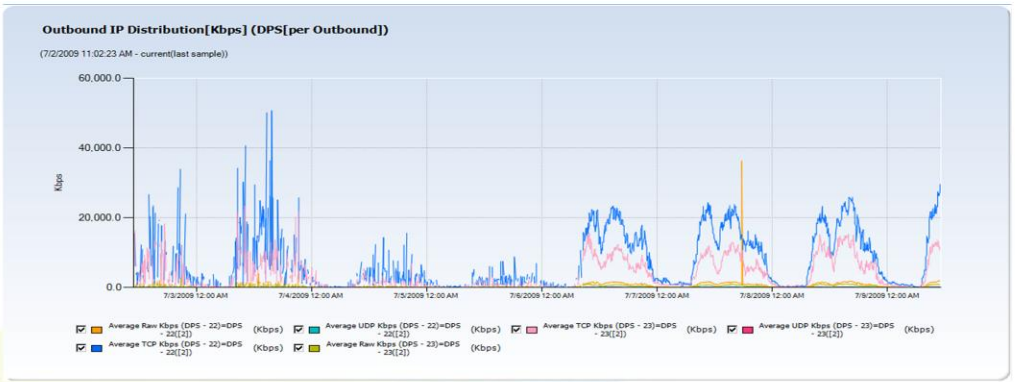


In this graph it can be seen the maximum OB data rate per DPS of this system.

SkyMon

Outbound IP Distribution (DPS)

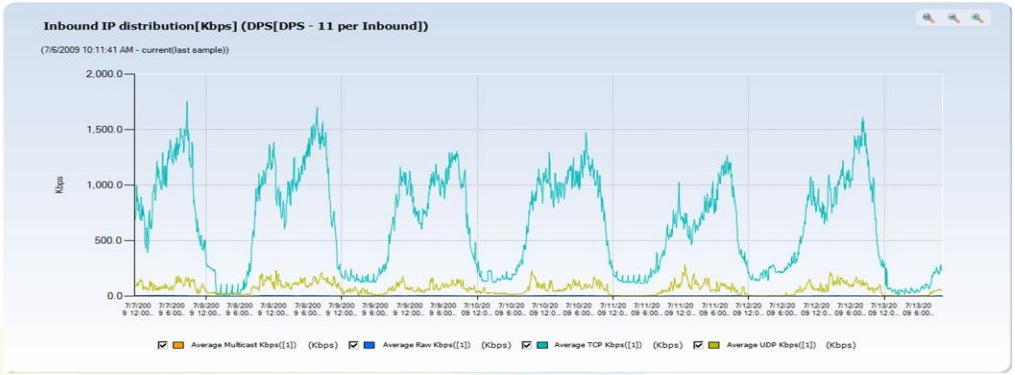
- **Shows number of Multicast, Raw data, TCP and UDP packets received by the DPS**
- **What do you see?**



SkyMon

Inbound IP Distribution (DPS)

- **Shows number of Multicast, Raw data, TCP and UDP packets sent to the DPS**
- **What do you see?**



In this Graph it can be seen the IP type distribution of the traffic per DPS.

SkyMon

Inbound Backbone Retransmission Report

- **Provides information about VSAT retransmission rates**
  - Pfail - Percentage of transmissions that fail
- **What do you see?**

IB BB Retransmission Report

Period: Last Week

First | Prev | **PAGE 1 / 1** | Next | Last

11/17/2008 - 11/24/2008

Total Vsats in Report:	9
Total IB BB Transmission:	1,745,880.00
Total IB BB Retransmission:	1,451.00
Total IB BB Pfail:	0.08 %

Resource Name	Transmission	Retransmission	Pfail
10.81.31.1 - 17058	19,557	0	0.00 %
10.81.34.1 - 17075	11,039	1	0.01 %
10.81.35.1 - 17076	1,178,258	390	0.03 %
10.81.7.1 - 17007	27,427	0	0.00 %
10.81.9.1 - 17009	27,939	2	0.01 %
10.83.1.1 - 17201	33,723	2	0.01 %
10.83.12.1 - 17225	89,543	55	0.06 %
10.83.14.1 - 17227	3,949	1	0.03 %
10.83.15.1 - 17228	92,185	78	0.08 %
10.83.16.1 - 17229	615,899	85	0.01 %
10.83.18.1 - 17231	438,652	1,028	0.23 %
10.83.19.1 - 17232	6,629	0	0.00 %
10.83.2.1 - 17202	10,310	0	0.00 %
10.83.22.1 - 17235	186,540	146	0.08 %
10.83.23.1 - 17236	216,846	1,447	0.67 %

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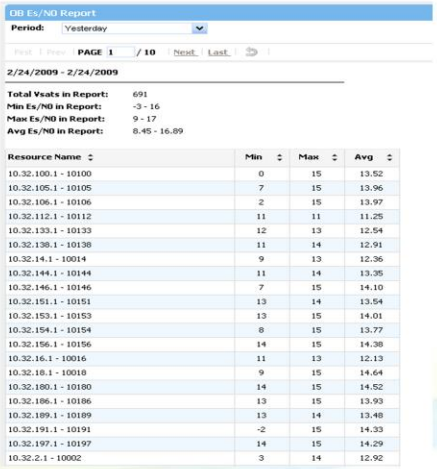
If a high retransmission rate is detected, the VSAT must be checked for antenna misalignment or ODU power level.

SkyMon

Outbound Es/No Report

- **Shows the minimum, maximum, and average Outbound Es/No readings received by the VSATs over the specified period**
- **What do you see?**



OB Es/N0 Report

Period: Yesterday

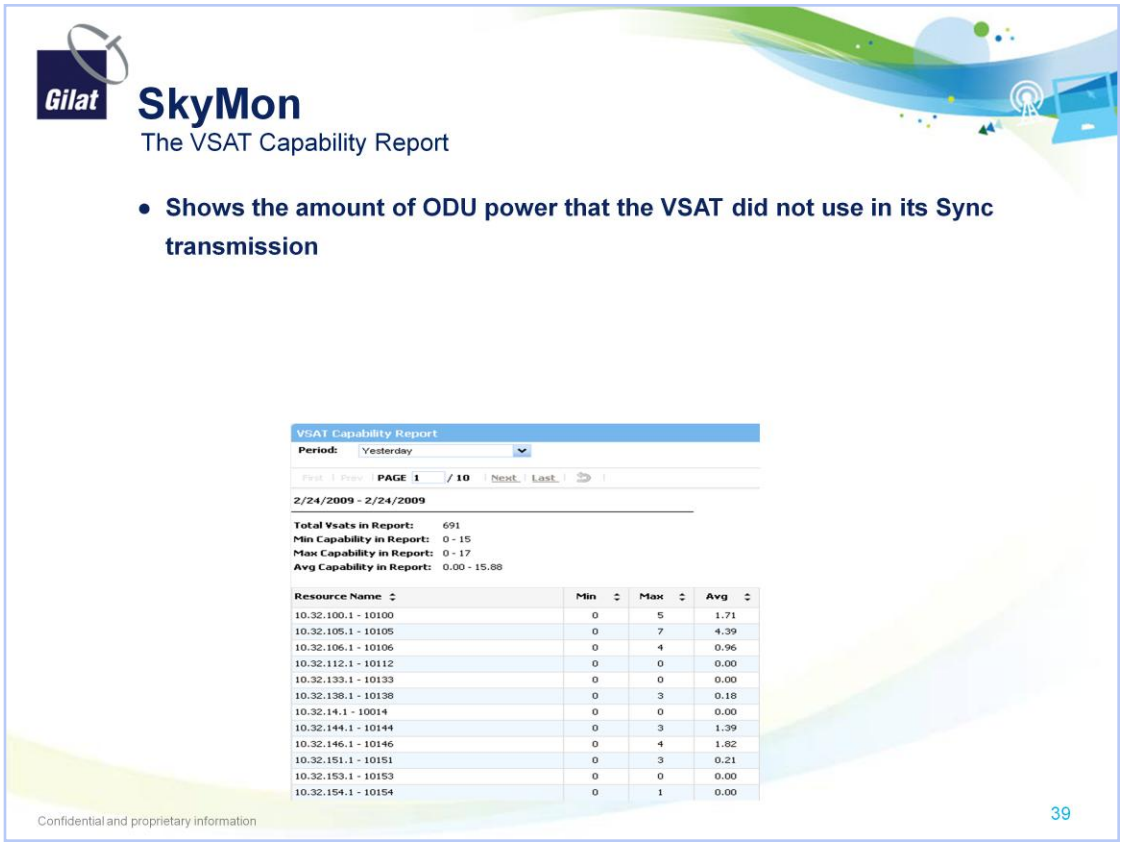
First | Prev | PAGE 1 / 10 | Next | Last

2/24/2009 - 2/24/2009

Total Vsats in Report: 691
Min Es/N0 in Report: -3 - 16
Max Es/N0 in Report: 9 - 17
Avg Es/N0 in Report: 8.45 - 16.89

Resource Name	Min	Max	Avg
10.32.100.1 - 10100	0	15	13.52
10.32.105.1 - 10105	7	15	13.96
10.32.106.1 - 10106	2	15	13.97
10.32.112.1 - 10112	11	11	11.25
10.32.133.1 - 10133	12	13	12.54
10.32.138.1 - 10138	11	14	12.91
10.32.14.1 - 10014	9	13	12.36
10.32.144.1 - 10144	11	14	13.35
10.32.146.1 - 10146	7	15	14.10
10.32.151.1 - 10151	13	14	13.54
10.32.153.1 - 10153	13	15	14.01
10.32.154.1 - 10154	8	15	13.77
10.32.156.1 - 10156	14	15	14.38
10.32.16.1 - 10016	11	13	12.13
10.32.18.1 - 10018	9	15	14.64
10.32.180.1 - 10180	14	15	14.52
10.32.186.1 - 10186	13	15	13.93
10.32.189.1 - 10189	13	14	13.48
10.32.191.1 - 10191	-2	15	14.33
10.32.197.1 - 10197	14	15	14.29
10.32.2.1 - 10002	3	14	12.92

The OB Es/No report provides the following information:
• Period - for which the report is generated.
• Total VSATs in Report - total number of VSATs in the report.
• Min Es/No in Report - the lowest and highest values of the Minimum Es/No measurements.
• Max Es/No in Report - the lowest and highest values of the Maximum Es/No measurements.
• Avg Es/No in Report - the lowest and highest values of the Average Es/No measurements.
• The minimum, maximum, and average Es/No measurement values are provided for each VSAT in the report.



VSAT Capability is the amount of ODU power that the VSAT does not use in its Sync transmission. For example, the 0 value (in minimum and maximum) indicates that the VSAT has used all the ODU available power for its Sync transmission, and therefore it can use only TRF with the same symbol and coding rate as the Sync.

High values indicate that a more efficient coding rate than the Sync can be used. The higher the value, the more efficient coding rate can be used. Under clear weather conditions, the difference between the maximum and minimum should not exceed 2 db. Under rain-fade conditions, it can drop dramatically, depending on the frequency range used (C-band is less sensitive than Ku-band).

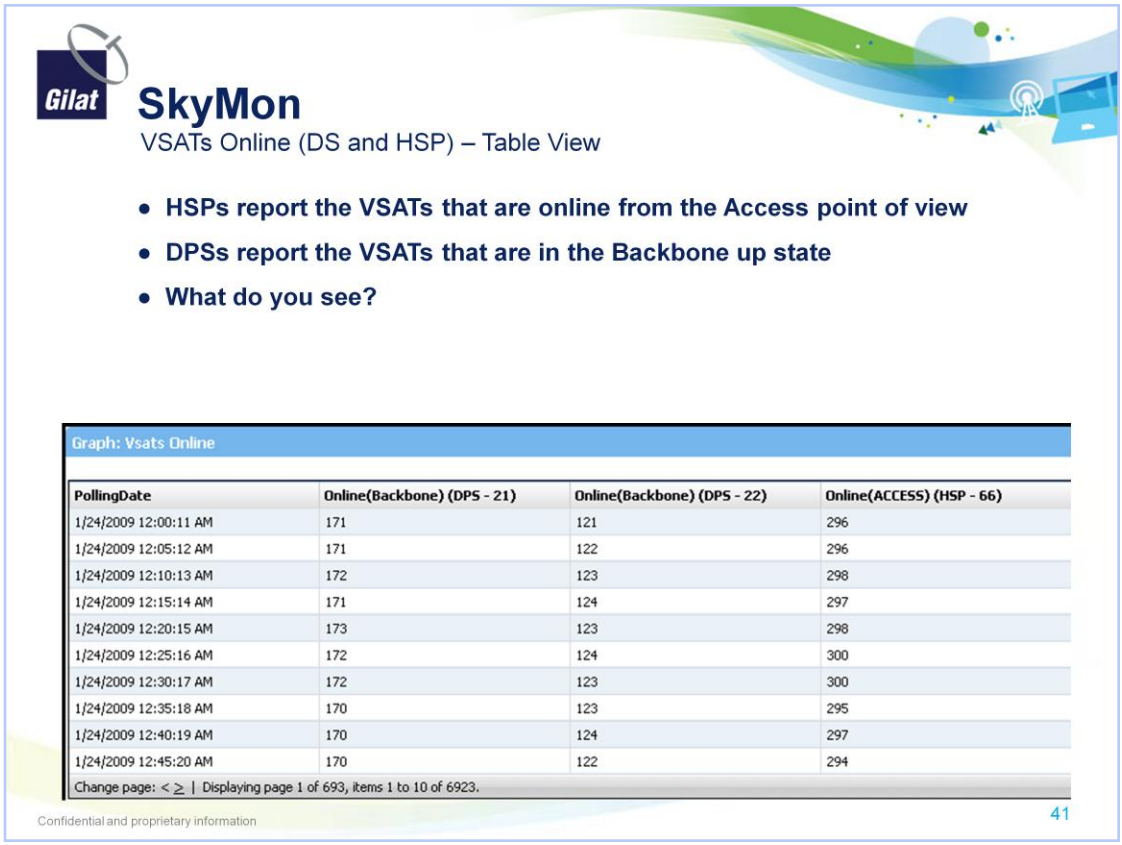
If there is a difference between the minimum and the maximum, it indicates that the VSAT suffers from the rain fade or other problems that must be investigated.

SkyMon

VSATs Online (DPS and HSP)

- **HSPs report the VSATs that are online from the Access point of view**
- **DPSs report the VSATs that are in the Backbone up state**

The VSATs Online report provides information about the number of VSATs that have been online during the period for which the report has been issued.
The report is based on the information received from the HSPs and DPSs.



This is the Table version of the previous graph.

Test Your Knowledge

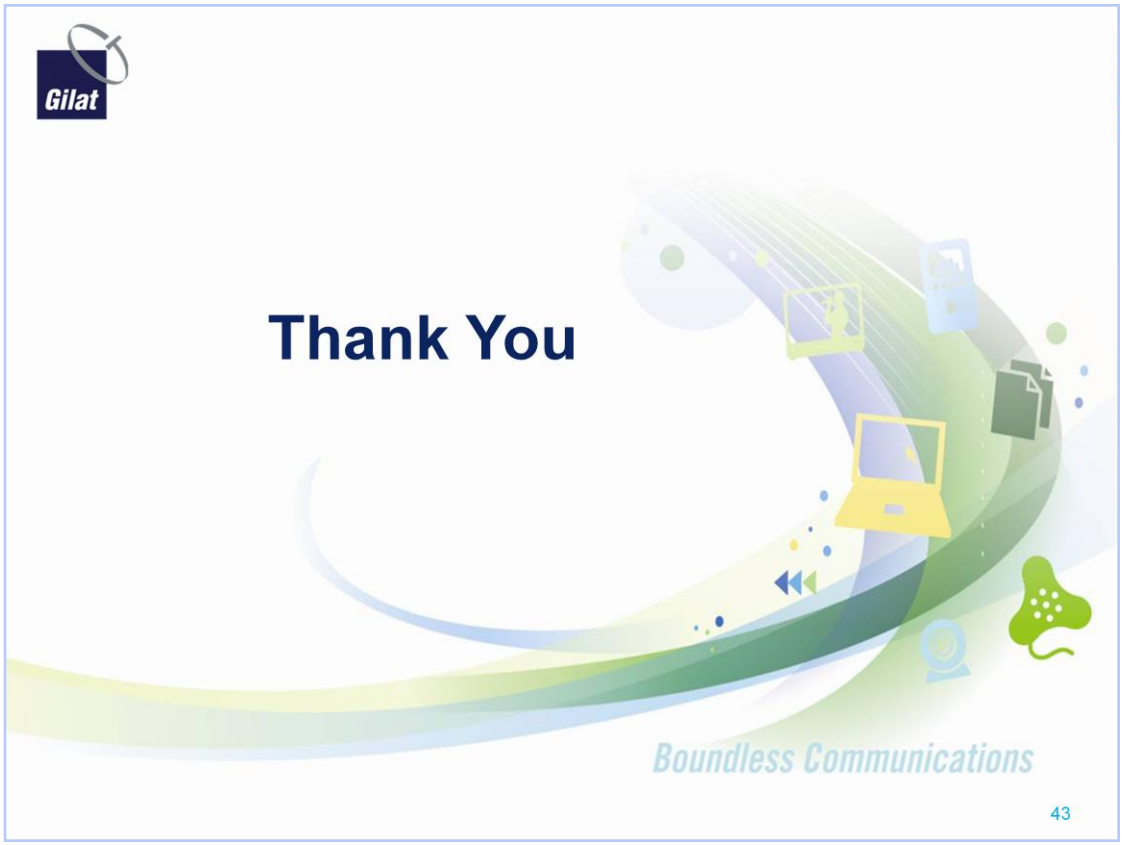
1. Why should the Sync utilization be lower than 95%?

2. In what case should the bit rate of the requested and received traffic be equal?

3. How do we check if a VSAT is not supplied with the minimum required bit rate?

4. What does it mean if a Slot type has 100% utilization?

5. What does 0 dB for a VSAT indicate, at both minimum and maximum capability report?


Gilat
Thank You
Boundless Communications
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