EXata学习(03):GSM网络场景

目的:掌握用EXata仿真GSM移动网络的基本方法

资料:参考D:\Scalable\exata\5.1\scenarios\cellular\gsm\handover 步骤:

1. 创建两个default devices节点1和2,拟作为MS,保存scenario文件:myGSM

2. 创建节点3-5拟作为BS, 节点6拟作为MSC;

3. 有线连接3-5到节点6,即三个BSs属于同一个MSC;

4. 创建一个无线子网,连接3-5到此无线子网。至此场景如下图



5. 配置节点1和2为MS:

- 复制系统Icon文件:从D:\Scalable\exata\5.1\gui\icons下复制GSM-MS、GSM-BS和GSM-MSC三个png 文件,作为2D和3D ICon文件。
- 设定节点1和2的 2D ICon和 3D Icon 均为GSM-MS.png文件: Table View: Nodes页选择节点1和2,分别命
 名为MS-A和MS-B
- 在Node Configureation: Network Layer中设定Network Protocol为 GSM Layer 3, GSM Node Type为
 Mobile Station



General Node Configuration Interfaces					
Mobility and Placement Network Layer Schedulers and Queues QoS Configuration Cyber ARP DHCP	Network Layer				
	Property	Value			
	[-] Network Protocol	GSM Layer 3	<u> </u>		
	GSM Node Configuration File	Specify GSM Configuration Fil	e in Supplemental F		
DNS Exed Communications	GSM Node Type	Mobile Station	•		
	IP Fragmentation Unit (bytes)	2048			
Router Properties Transport Laver	Enable Explicit Congestion Notification	No	•		
	[-] Enable ICMP	Yes	-		
	Is ICMP Router?	No	-		
	[-] Enable Redirect	Yes	-		
OS Resource Model	Redirect Retry Time	1	seconds 💌		
File Statistics	Allow Override of Non-Static Routes	Yes	•		
- Statistics Database - Packet Tracing	Router Advertisement Life Time	1800	seconds 💌		
	Minimum Router Advertisement Interval	450	seconds 💌		
	Maximum Router Advertisement Interval	600	seconds 💌		
	Maximum Number of Solicitation	3			
	Enable ICMP Error Messages	No	•		
	Configure as a Link 16/IP Gateway	No	•		
	Enable Mobile IP	No	-		

6. 配置节点3-5为BS:

○ 方法类似MS设置,将三个节点的Network Protocol设定为GSM Layer 3,不同的是GSN Node Type设定为

Mobility and Placement Network Layer Schedulers and Queues Occ. Configuration	Netwo	rk Layer	
	Property	Value	
QoS Configuration	[-] Network Protocol	GSM Layer 3	•
ARP	GSM Node Configuration File	Specify GSM Configuration F	ile in Supplementa
DHCP DNS Fixed Communications Fixed Communications Routing Protocol Router Properties Transport Layer MPLS Application Layer Network Management User Behavior Model Battery Model	[-] GSM Node Type	Base Station	•
	Handover Margin (dB)	0.0	
	IP Fragmentation Unit (bytes)	2048	
	Enable Explicit Congestion Notification	No	
	[-] Enable ICMP	Yes	ŀ
	Is ICMP Router?	No	
OS Resource Model	[-] Enable Redirect	Yes	
File Statistics	Redirect Retry Time	1	seconds
Packet Tracing	Allow Override of Non-Static Routes	Yes	-
	Router Advertisement Life Time	1800	seconds
	Minimum Router Advertisement Interval	450	seconds
	Maximum Router Advertisement Interval	600	seconds
	Maximum Number of Solicitation 3		
	Enable ICMP Error Messages	No	-
	Configure as a Link 16/IP Gateway	No	-
	Enable Mobile IP	No	

- o 分别重命名为BS1、BS2、BS3
- 设定其2D和3D ICon为GSM-BS,至此,场景如下图



- 7. 设定节点6为MSC:
 - 方法类似MS和BS的设定方法,不同的是GSM Node Type选择Mobile Switching Center

Mobility and Placement	Netwo	rk Layer	
Schedulers and Queues	Property	Value	
 QoS Configuration Cyber 	[-] Network Protocol	GSM Layer 3	•
ARP	GSM Node Configuration File	Specify GSM Configuration F	ile in Supplementa
DNS	GSM Node Type	Mobile Switching Center	•
Routing Protocol	IP Fragmentation Unit (bytes)	2048	
Router Properties	Enable Explicit Congestion Notification	No	
MPLS	[-] Enable ICMP	Yes	
 Application Layer Network Management 	Is ICMP Router?	No	
User Behavior Model Battery Model	[-] Enable Redirect	Yes	
···· OS Resource Model	Redirect Retry Time	1	seconds
Faults	Allow Override of Non-Static Routes	Yes	
File Statistics Statistics Database	Router Advertisement Life Time	1800	seconds
···· Packet Tracing	Minimum Router Advertisement Interval	450	seconds
	Maximum Router Advertisement Interval	600	seconds
	Maximum Number of Solicitation	3	
	Enable ICMP Error Messages No	No	
	Configure as a Link 16/IP Gateway	No	
	Enable Mobile IP	No	

o 选择2D和3D ICon为GSM-MSC,至此,场景如下图



- 8. 设定场景的Channel Properties: Scenario Properties: Channel Properties, 设定Number of Channels为
 - 32, 仿造GSM/handover场景中。【用到Open Current Scenario in File Editor功能】
 - 。 在File Editor中打开GSM/Handover场景;
 - o 复制Channel Properties段的内容行

File Edit Help	EX EX	Xata
Image: Architect Image: Analyzer Image: Placket Tracer Im	File E	Edit Help
Image: The second se		Architect 📊 Analyzer 🔤 Packet Tracer 🔚 File Editor
handover.config YERSIGNT 12:10 EXPERIMENT-ANAME handover EXPERIMENT-COMMENT NONE SMULATION-TIME 150S SED 1 GUI-CONFIG-LOCKED NO #************************************		
29:73 Find Previous	File List File System	handover.config VERSUM 12.10 EXPERIMENT-NAME handover EXPERIMENT-NAME handover EXPERIMENT-NAME handover EXPERIMENT-COMMENT NONE SIMULATION-TIME 1505 SEED 1 GUI-CONFIG-LOCKED NO #************************************

○ 粘贴到myGSM场景文件中的Channel Properties段落部分, 【<mark>注意:需要保存myGSM场景后,重新打开,</mark>

<mark>配置框中才能显示更新后的Number of Channels</mark>】,原为1,现在为32,而且是GSM频段。

	Chan	nel Properties		
P	Property	Value		
Number of Channels		32	4	
	Array Editor		11	?
	Number of Channels: 32	Pro	perties	
	Index 0 : chann ▲ Index 1 : chann Index 2 : chann	General		🕮 He
	Index 3 : chann Index 4 : chann	General	Properties	
	Index 5 : chann	Property	Value	
	Index 7 : chann	Channel Name	channel0	
	Index 8 : chann Index 9 : chann	Channel Frequency	935	MHz 💌 🔳
	Index 10 : chan	Pathloss Model	Two Ray	•
	Index 12 : chan	[-] Shadowing Model	Constant	•
	Index 13 : chan Index 14 : chan	Shadowing Mean (dB)	4.0	
	Index 15 : chan	Fading Model	None	•
	Index 17 : chan	Enable Inter-channel Interfernce	No	•
	Index 18 : chan Index 19 : chan	Signal Propagation Speed (m/s)	3e8	
	Index 20 : chan Index 21 : chan	Propagation Limit (dBm)	-111.0	
	Index 22 : chan	Maximum Propagation Distance	0	
	Index 23 : chan	Propagation Communication Proximit	y 400	
	Index 25 : chan Index 26 : chan	Propagation Profile Update Ratio	0.0	
Find	Index 27 : chan			

- 9. 设定无线子网参数
 - o Table View: Network中选择Wireless Subnet,双击打开属性框;
 - 在在Physical Layer的Listenable Channels中选择部分或全部Channels; Listening Channels为Channel0,
 即整个子网监听Channel0【问题: 能否选择多个信道?】; Radio Type中选择GSM。

eneral Physical Layer MAC Layer Network Layer R	outing Protocol Router Properties File Statistics	🕮 Help			
Physical Layer					
Property Value					
Listenable Channels	channel0, channel1, channel2, channel3, channel4, channel5				
Listening Channels	channel0				
[-] Radio Type	GSM				
Data Rate	270.833 Kbps	-			
Transmission Power (dBm)	15.0				
Receive Sensitivity (dBm)	-91.0				
Receive Threshold (dBm)	-92.0				
[-] Packet Reception Model	BER-based Reception Model	-			
Number of BER Tables	1				
[-] Specify Antenna Model from File	No	-			
Antenna Model	Omnidirectional	-			
Antenna Gain (dB)	0.0				
Antenna Height (meters)	1.5				
Antenna Efficiency	0.8				
Antenna Mismatch Loss (dB)	0.3				
Antenna Cable Loss (dB)	0.0				
Antenna Connection Loss (dB)	0.2				
Antenna Orientation Azimuth (degrees)	0				
Antenna Orientation Elevation (degrees)	0	-			

• 此时,查看该无线子网的三个BS的interface0的Physical Layer属性则与子网属性一致。

○ 设定无线子网接口的MAC层: Table View: Interfaces,选择三个基站的PHY-GSM接口,设定其MAC层为GSM,注意观察节点类型为Base Station

Interfaces	0.0.1.3)		r 🔺
⊡ Interface 0		MAC Layer	
MAC Layer	Property	Value	
Network Layer Schedulers and Oue	[-] MAC Protocol	GSM	- 4
QoS Configuration	GSM Node Type	Base Station	
ARP	BS Downlink Control Channel	[0]	
DHCP	Location Area Code	1	
Fixed Communications	Cell Identity	1	
File Statistics	Channel Range	0-3	
	Neighboring Base Stations	0-0-0	
	MAC Propagation Delay	1	micro-seconds 💌
	Enable Promiscuous Mode	No	•
	Enable LLC	No	_
	Configure MAC Address	No	
, jage Find	<u>,</u>	Apply OK Ca	ancel Add To Batch

0

10. 设定终端接口协议栈:

- o 在Table View: Interfaces中选择两个MS的Interface0,双击打开属性框
- 在Physical Layer的Radio Type中选择GSM

Interface 0	Dhysic	al Laver	
Physical Layer	Droparty	1 Layer	
Network Layer	Listenable Channels	channel0	
 Schedulers and Que OoS Configuration 	Listening Chappels	channelo	
Cyber			
DHCP	L-J Radio Type	270.022	
DNS Eixed Communications	Data Kate	270.833 KDps	
Routing Protocol	Transmission Power (dBm)	15.0	
····· File Statistics	Receive Sensitivity (dBm)	-91.0	
	Receive Threshold (dBm)	-92.0	
	[-] Packet Reception Model	BER-based Reception Model	•
	Number of BER Tables	1	
	[-] Specify Antenna Model from File	No	-
	Antenna Model	Omnidirectional	•
	Antenna Gain (dB)	0.0	
	Antenna Height (meters)	1.5	
	Antenna Efficiency	0.8	
	Antenna Mismatch Loss (dB)	0.3	
	Antenna Cable Loss (dB)	0.0	
	Antenna Connection Loss (dB)	0.2	
	Antenna Orientation Azimuth (degrees)	0	

[•] 在Listenable Channels选择部分或全部信道,与BS的Interface配置相同

Interface Properties (Interface 16	9.0.0.1)		?	×
Interfaces			📫 He	elp
⊡ Interface 0	Physica	Physical Layer		
MAC Layer Network Layer Schedulers and Oue	Property	Value		
	Listenable Channels	el1, channel2, channel3, channel4, channel5		
QoS Configuration	Listening Channels	channel0		
ARP	[-] Radio Type	GSM	• •	
DHCP	Data Rate	270.833 Kbps	•	
Fixed Communications	Transmission Power (dBm)	15.0		
File Statistics	Receive Sensitivity (dBm)	-91.0		
	Receive Threshold (dBm)	-92.0		
	[-] Packet Reception Model	BER-based Reception Model	-	
	Number of BER Tables	1		
	[-] Specify Antenna Model from File	No	•	
	Antenna Model	Omnidirectional	•	
	Antenna Gain (dB)	0.0		
	Antenna Height (meters)	1.5		
	Antenna Efficiency	0.8	_	
	Antenna Mismatch Loss (dB)	0.3	_	
	Antenna Cable Loss (dB)	0.0		1
	Antenna Connection Loss (dB)	0.2		
	Antenna Orientation Azimuth (degrees)	0		
	Antenna Orientation Elevation (degre	0	<u> </u>	1
Left Find	Ap	oply OK Cancel Ad	d To Bat	ch

 配置无线接口MAC层: Interface0--》MAC Layer,选MAC Protocol为GSM,确认GSM Node Type为 Mobiel Station。

Group Interface Properties (Interfa	ace 169.0.0.1, Interface 169.0.0.2)		? 🕰 He
⊡ Interface 0		MAC Layer	
MAC Layer	Property	Va	lue
Schedulers and Que	[-] MAC Protocol	GSM	- 4
QoS Configuration	GSM Node Type	Mobile Station	
ARP	GSM Control Channel List	[0]	
DNS	MAC Propagation Delay	1	micro-seconds 💌
Fixed Communications For Routing Protocol	Enable Promiscuous Mode	No	•
File Statistics	Enable LLC	No	•
	Configure MAC Address	No	•
Find		Apply OK	Cancel Add To Bat

11. 添加应用:

o Applications中选择GSM,从节点1到节点2添加.设置参数如下;设置Simulation Time: 150s。

G	SM Call Properties		?		×
Ge	eneral			🕮 н	elp
Г	General	Properties			-
	Property	Value			
	Source	1		-	
	Destination	2		-	
	Call Start Time	20	seconds	<u> </u>	4
	Call Duration	90	seconds	- 4	4
à	Find	Apply OK	Cancel Add	To Ba	tch

12. Run Simulation,发现错误:提示"GSM-NODE-TYPE not specified"

Attempting license checkout (should take less than 2 seconds) ...Loading scenario myGSM.config Assertion (wasFound != FALSE) failed in file ...\libraries\cellular\src\mac_gsm.cpp:2411 GSM-NODE-TYPE not specified ------ Nov 09, 2022 8:12:09 pm ------Launching simulator/emulator: D:/Scalable/exata/5.1/bin/exata.exe with args: myGSM.config -np 1 -interactive 127. unknown option -emulation EXata Developer Version 5.1 Kernel Version: 12.10 Build Number: 201310091 Build Date: Oct 9 2013, 18:55:48 EXATA_HOME = D:\Scalable\exata\5.1 Attempting license checkout (should take less than 2 seconds) ...Loading scenario myGSM.config Assertion (wasFound != FALSE) failed in file ...\libraries\cellular\src\mac_gsm.cpp:2411 GSM-NODE-TYPE not specified

13. 寻找错误根源

a. 补充MS的Packet Reception Model (在Interface0的Physical Layer, 默认为空): Ber-based Recpetion

Model;节点1和2都修改完后,

Default Device Properties (Defaul	t Device 1)		?	×
General Node Configuration I	interfaces			Help
⊡. Interface 0	Physical Layer			<u> </u>
MAC Layer	Property	Value		Í
Network Layer Routing Protocol	Listenable Channels	el1, channel2, channel3, channel4, channel5		
Faults File Statistics	Listening Channels	channel0		
	[-] Radio Type	GSM	- 4	
	Data Rate	270.833 Kbps	-	
	Transmission Power (dBm)	15.0		
	Receive Sensitivity (dBm)	-91.0		
	Receive Threshold (dBm)	-92.0		
	[-] Packet Reception Model	BER-based Reception Model	•	
	Number of BER Tables	1		
	[-] Specify Antenna Model from File	No	•	
	Antenna Model	Omnidirectional	-	
	Antenna Gain (dB)	0.0		
	Antenna Height (meters)	1.5		
	Antenna Efficiency	0.8		
	Antenna Mismatch Loss (dB)	0.3		
	Antenna Cable Loss (dB)	0.0		
	Antenna Connection Loss (dB)	0.2		
	Antenna Orientation Azimuth (degrees)	0		
	Antenna Orientation Elevation (degre	0		
	Temperature (K)	290.0		
	Noise Factor	10.0		
	Energy Model	None		
🔍 Find	Ap	OK Cancel Ad	d To	Batch

i. 仍有错误, 但原因改变为:

Attempting license checkout (should take less than 2 seconds) ...Loading scenario myGSM.config Error in file ..\libraries\wireless\src\phy.cpp:1226 PHY-RX-BER-TABLE-FILE is not specified

ii. 从字面理解是缺乏BER Table File, 点击Number of BER Table 栏"1"后面的省略号进行选定文件, 默认

为空,选择与GSM/Handover场景中相同的文件,D:\Scalable\exata\5.1\data\modulation下的

gmsk.ber:

Array Editor						?	×
Number of BER Tables: 1		Prop	erties				
Index 0	General						Help
	G	eneral P	rope	rties			
	Property				Value		
	BER Table		F:/ex	/myGSM/gms	k.ber		◀
]						- 11
		App	y -	ОК	Cancel	Add To	Batch

iii. 节点1和节点2的修改完后,仍有错误: 【又变成了GSM-NODE-TYPE not specified!!!】

 $\label{eq:assertion:Assertion(wasFound != FALSE) failed in file ..\libraries\cellular\src\mac_gsm.cpp:2411 GSM-NODE-TYPE not specified$

iv. 推测可能是基站测的Packet Reception Model做相同的修改:修改三个BSs的Interface0的Physical

Layer--》Packet Reception Model,同上【问题:发现从Table View的Interface进行属性设置,跟拓

<mark>扑中点节点的Interface进去居然不一样?!</mark>】从节点3的Interface进入

Default Device Properties (Defa	ault Device 3)	?	×
General Node Configuration	Interfaces	🖽 He	elp
⊡ Interface 0	Physic	al Layer	-
MAC Layer	Property	Value]
Network Layer Network Dayer The Routing Protocol	Listenable Channels	nel1, channel2, channel3, channel4, channel5	
- Faults File Statistics	Listening Channels	channel0	
⊡ Interface 1	[-] Radio Type	GSM 💌 🖪	
	Data Rate	270.833 Kbps 💌	
	Transmission Power (dBm)	15.0	
	Receive Sensitivity (dBm)	-91.0	F
	Receive Threshold (dBm)	-92.0	F
	Packet Reception Model		
	[-] Specify Antenna Model from File	No	Ĩ
	Antenna Model	Omnidirectional 💌	
	Antenna Gain (dB)	0.0	F
	Antenna Height (meters)	1.5	F
	Antenna Efficiency	0.8	F
	Antenna Mismatch Loss (dB)	0.3	F
	Antenna Cable Loss (dB)	0.0	F
	Antenna Connection Loss (dB)	0.2	F
	Antenna Orientation Azimuth (degrees)	0	F
	Antenna Orientation Elevation (degrees)	0	F
	Temperature (K)	290.0	F
	Noise Factor	10.0	F
	Energy Model	None	ĺ
	J		
🔍 Find	Арр	OK Cancel Add To Bat	ch

v. 从 Table View: Interfaces进入

Interface Properties (Interface 19	0.0.1.3)		?	×
Interfaces				Help
⊡ Interface 0	Physical Layer			-
Physical Layer MAC Layer	Property	Value		
• Network Layer	Listenable Channels	el1, channel2, channel3, channel4, channel5		
Faults	Listening Channels	channel0		
File Statistics	[-] Radio Type	GSM _]	
	Data Rate	270.833 Kbps	-	
	Transmission Power (dBm)	15.0		
	Receive Sensitivity (dBm)	-91.0		
	Receive Threshold (dBm)	-92.0		
	[-] Packet Reception Model	BER-based Reception Model	•	
	Number of BER Tables	1		
	[-] Specify Antenna Model from File	No	-	
	Antenna Model	Omnidirectional	•	
	Antenna Gain (dB)	0.0		
	Antenna Height (meters)	1.5		
	Antenna Efficiency	0.8		
	Antenna Mismatch Loss (dB)	0.3		
	Antenna Cable Loss (dB)	0.0		
	Antenna Connection Loss (dB)	0.2		
	Antenna Orientation Azimuth (degrees)	0		
	Antenna Orientation Elevation (degre	0		
	Temperature (K)	290.0		
	Noise Factor	10.0		
	Energy Model	None	-	.
A Find	Ap	oply OK Cancel Add	i To B	latch

vi. GSM Control Channel List

Default Device Properties (Defau	t Device 14)		? ×
General Node Configuration Interfaces			
⊡ Interface 0	MAC Layer		
MAC Layer	Property	Val	ue
• Network Layer • Routing Protocol	[-] MAC Protocol	GSM	
Faults File Statistics	GSM Node Type	Mobile Station	
	GSM Control Channel List	[0 8 16 24]	4
	MAC Propagation Delay	1	micro-seconds 💌
	Enable Promiscuous Mode	Yes	
	Enable LLC	No	•
	Configure MAC Address	No	•
📐 Find		Apply OK	Cancel Add To Batch

vii. 应该是找到问题了: 节点4在Node Configuration中的节点类型为BS, 但在Interfaces: MAC Layer的

GSM Node Type为 Base Station, 二者不一致

Default Device Properties (Defau	t Device 4)		? >		
General Node Configuration Interfaces					
Mobility and Placement	Network Layer				
Schedulers and Queues	Property	Value			
QoS Configuration	[-] Network Protocol	GSM Layer 3	- 4		
ARP	GSM Node Configuration File	Specify GSM Configuration F	ile in Supplemental F		
DNS Fixed Communications Routing Protocol Router Properties Transport Layer	[-] GSM Node Type	Base Station	• •		
	Handover Margin (dB)	0.0			
	IP Fragmentation Unit (bytes)	2048			
MPLS	Enable Explicit Congestion Notification	No	_		
Network Management	[-] Enable ICMP	Yes	_		
User Behavior Model Battery Model	Is ICMP Router?	No	▼		
OS Resource Model	[-] Enable Redirect	Yes	•		
Faults	Redirect Retry Time	1	seconds 💌		
Statistics Database	Allow Override of Non-Static Routes	Yes	•		
····· Packet Tracing	Router Advertisement Life Time	1800	seconds 💌		
	Minimum Router Advertisement Interval	450	seconds 💌		
	Maximum Router Advertisement Interval	600	seconds 💌		
	Maximum Number of Solicitation	3			
	Enable ICMP Error Messages	No	•		
	Configure as a Link 16/IP Gateway	No	•		
	Enable Mobile IP	No	•		
📐 Find	Арр	by OK Car	Add To Batch		

与上面不一致!

Default Device Properties (Defau	lt Device 4)		? ×
General Node Configuration	Interfaces		🚇 Help
⊡ Interface 0		MAC Layer	
MAC Layer	Property	Value	
Network Layer Routing Protocol	[-] MAC Protocol	GSM	• •
Faults File Statistics	GSM Node Type	Mobile Station	
	GSM Control Channel List	[0 8 16 24]	4
	MAC Propagation Delay	1	micro-seconds 💌
	Enable Promiscuous Mode	No	•
Default Device Properties (Default Device 4) ? eneral Node Configuration Interfaces Interface 0 MAC Layer Physical Layer Property Value Physical Layer Property Value Interface 1 GSM Node Type Mobile Station Bit Interface 1 GSM Node Type No Enable Promiscuous Mode No Image: Statistice	•		
	Configure MAC Address	No	•
🧟 Find		Apply OK Can	cel Add To Batch

viii. 但从Table View 的 Interface0: MAC Layer进来看类型又是对的【真是晕了!】

Interface Properties (Interface	90.0.1.2)		?	×
Interfaces			Ľ,) Help
⊡ Interface 0		MAC Layer		_
MAC Layer	Property	Value		
Network Layer Routing Protocol	[-] MAC Protocol	GSM	-	4
Faults File Statistics	GSM Node Type	Base Station		_
	BS Downlink Control Channel	[0]		
	Location Area Code	1		
	Cell Identity	1		
	Channel Range	0-3		
	Neighboring Base Stations	0-0-0		
	MAC Propagation Delay	1 micro-s	econds	•
	Enable Promiscuous Mode	No		•
	Enable LLC	No		•
	Configure MAC Address	No		-
ind Find		Apply OK Cancel	Add To	Batch

14. 利用Notepad++对比myGSM和GSMExample两个文件,发现myGSM的 GUI和config文件不一致【不知何原因】。比如: Packet Reception Model: GUI显示为BER-based,但Config文件中却为802.11b【通过对比

EXata7.0版本确定,属于软件Bug】

#********* [Default Wireless Subnet] ************************************	
SUBNET N8-169.0.0.0 {1, 2} Default	
#******************************Physical Layer************************************	
[N8-169.0.0.0] PHY-MODEL PHY-GSM	
[N8-169.0.0.0] PHY-GSM-DATA-RATE 270833	
[N8-169.0.0.0] PHY-GSM-TX-POWER 20.0	
[N8-169.0.0.0] PHY-GSM-RX-SENSITIVITY -110.0	
[N8-169.0.0.0] PHY-GSM-RX-THRESHOLD -90.0	
[N8-169.0.0.0] PHY-RX-MODEL PHY802.11b	
[N8-169.0.0.0] DUMMY-ANTENNA-MODEL-CONFIG-FILE-SPECIFY NO	
[N8-169.0.0.0] ANTENNA-MODEL OMNIDIRECTIONAL	
[N8-169.0.0.0] ENERGY-MODEL-SPECIFICATION NONE	

Wireless Subnet Properties (Default Wireless Subnet 169.0.0.0)		?	×
General Physical Layer MAC Layer Network Layer Rou	ting Protocol Router Properties File Statistics		Help
Physica	al Layer		-
Property	Value		
Listenable Channels	channel0		
Listening Channels	channel0		
[-] Radio Type	GSM 💌		
Data Rate	270.833 Kbps	-	
Transmission Power (dBm)	20.0	4	
Receive Sensitivity (dBm)	-110.0	4	
Receive Threshold (dBm)	-90.0	4	
[-] Packet Reception Model	BER-based Reception Model	-	
Number of BER Tables	1		
[-] Specify Antenna Model from File	No	-	
Antenna Model	Omnidirectional	-	
Antenna Gain (dB)	0.0		
Antenna Height (meters)	1.5		
Antenna Efficiency	0.8		
Antenna Mismatch Loss (dB)	0.3		
Antenna Cable Loss (dB)	0.0	-	
Antenna Connection Loss (dB)	0.2		
Antenna Orientation Azimuth (degrees)	0		
Antenna Orientation Elevation (degrees)	0		-
🔍 Find	Apply OK Cancel Add	To B	latch

15. 但是经7.0保存后的场景文件, 5.1运行会出现IP地址格式不能认的错误!无语!

---- Nov 12, 2022 10:28:00 am -----

Launching simulator/emulator: D:/Scalable/exata/5.1/bin/exata.exe with args: myGSM.config -np 1 -interactive 127.0.0.1 4001 -with-snt-gui -friendly -emula unknown option -emulation EXata Developer Version 5.1 Kernel Version: 12.10 Build Number: 201310091 Build Date: Oct 9 2013, 18:55:48 EXATA_HOME = D:\Scalable\exata\5.1

Attempting license checkout (should take less than 2 seconds) ...Error in file ..\kernel\src\qualnet_error.cpp:138 Bad IP address string: SUB1/1/0

16. 在GSM Node Congiureation之后, 会生成GSM-NODE-CONFIG-FILE: myGSM.gsm, 其中myGSM为场景名