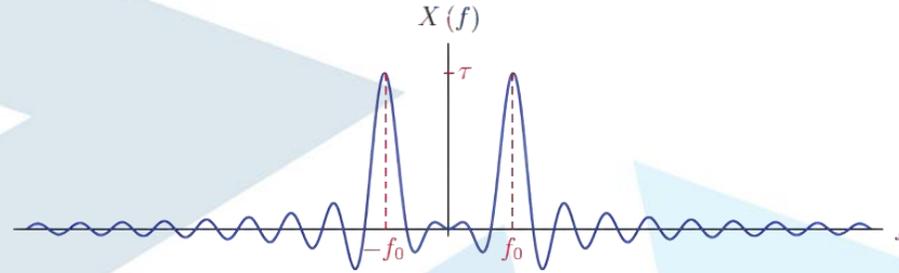


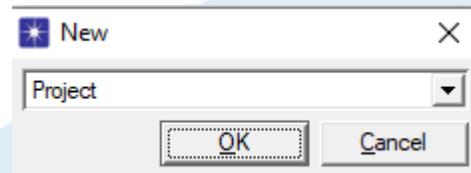
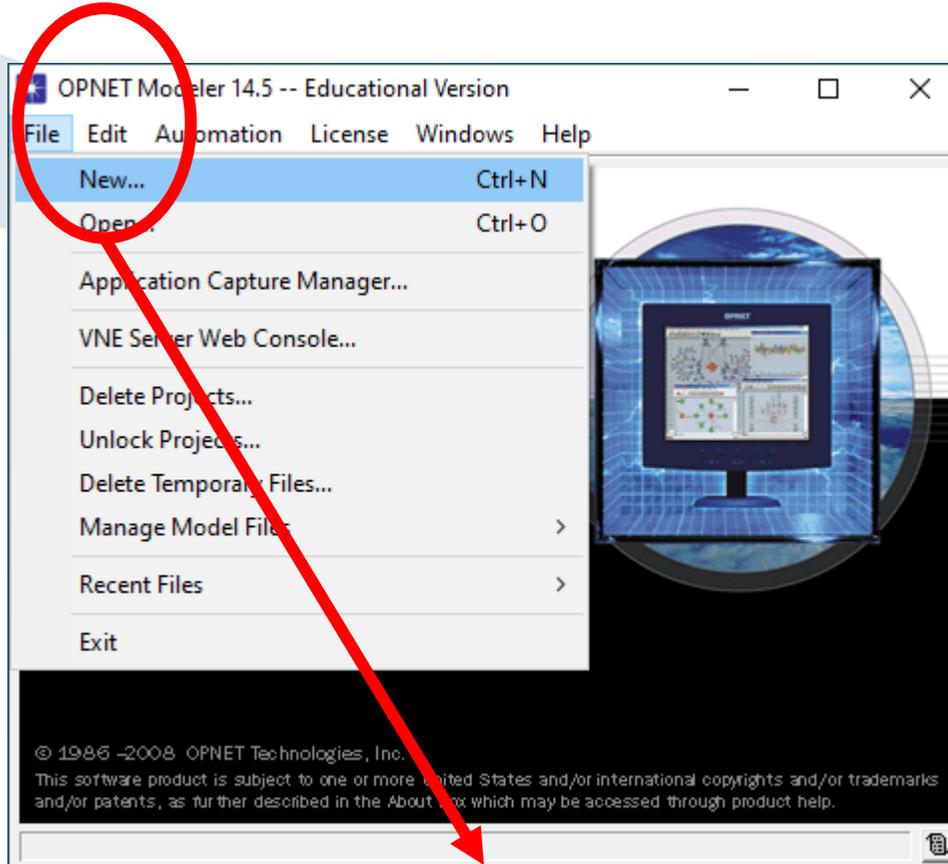
# CEMC606: Industrial Networks

## Lecture 2: Ethernet Networks –Star Connection

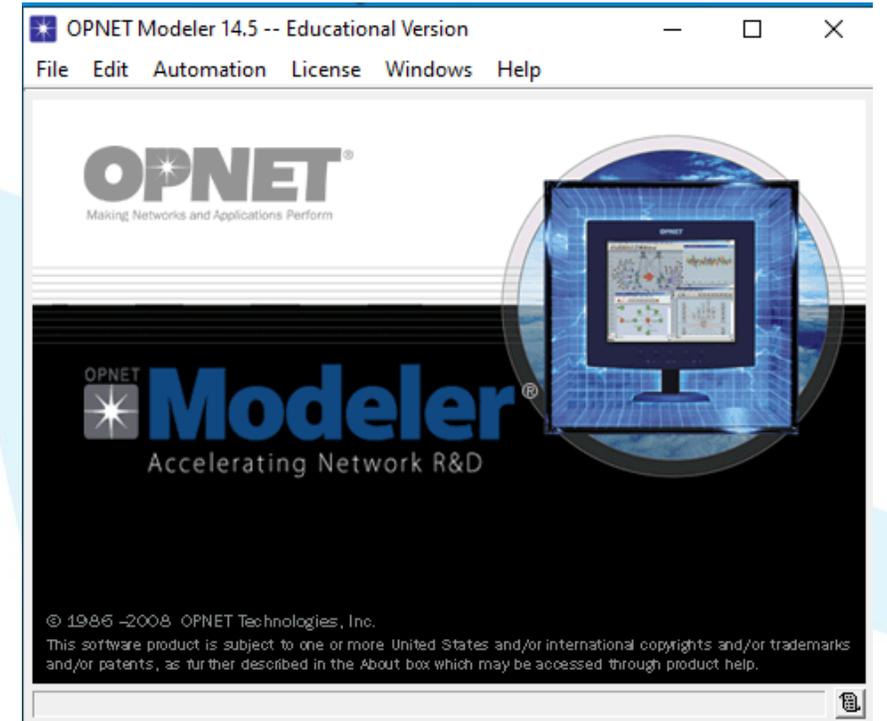


**Eng. Aya Kherbek**  
**Eng. Baher Kherbek**  
**Faculty of Engineering**  
**Department of Mechatronics**  
**Manara University**

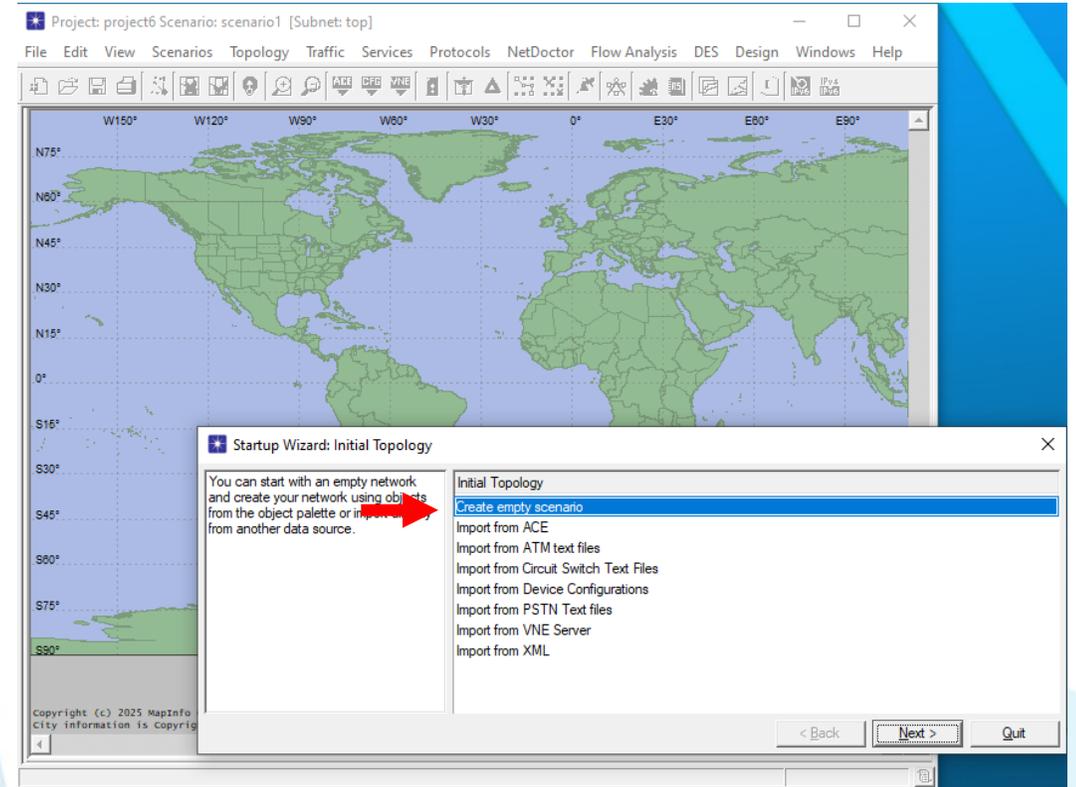
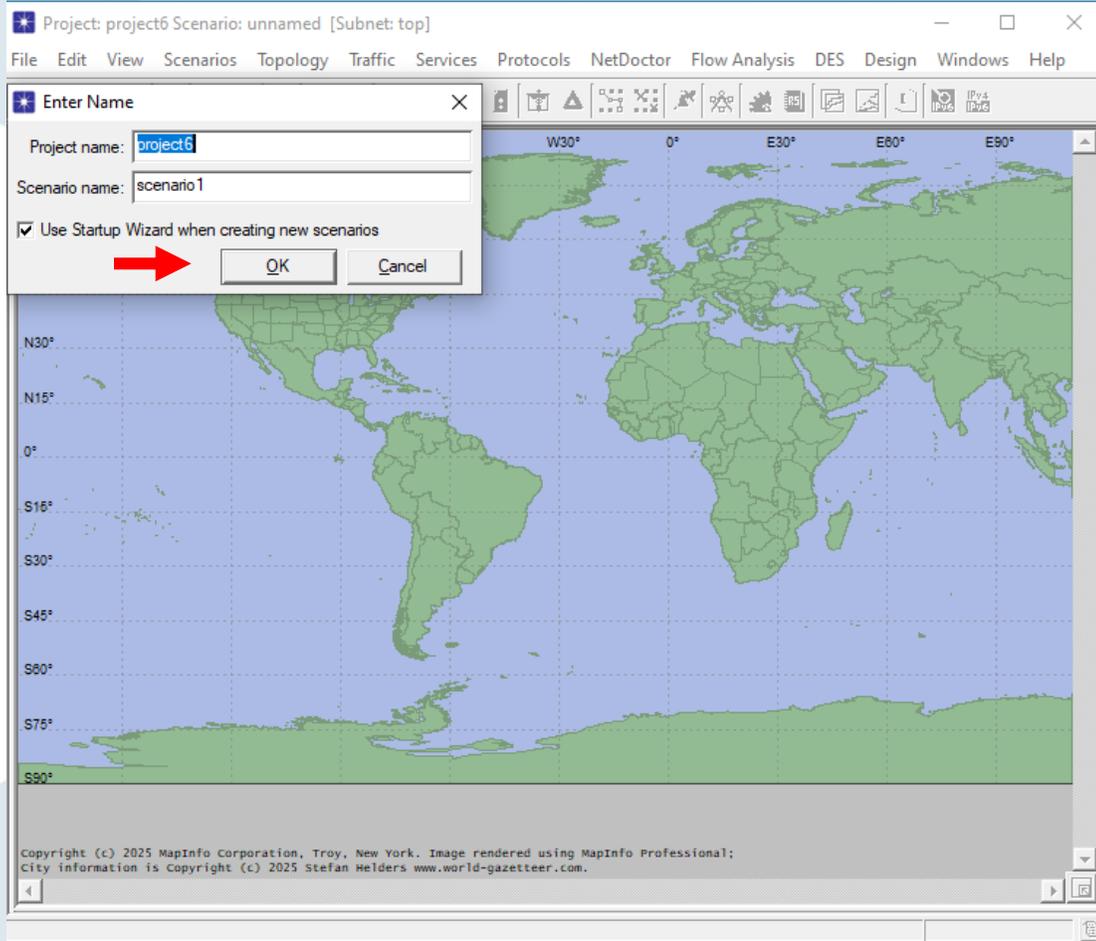


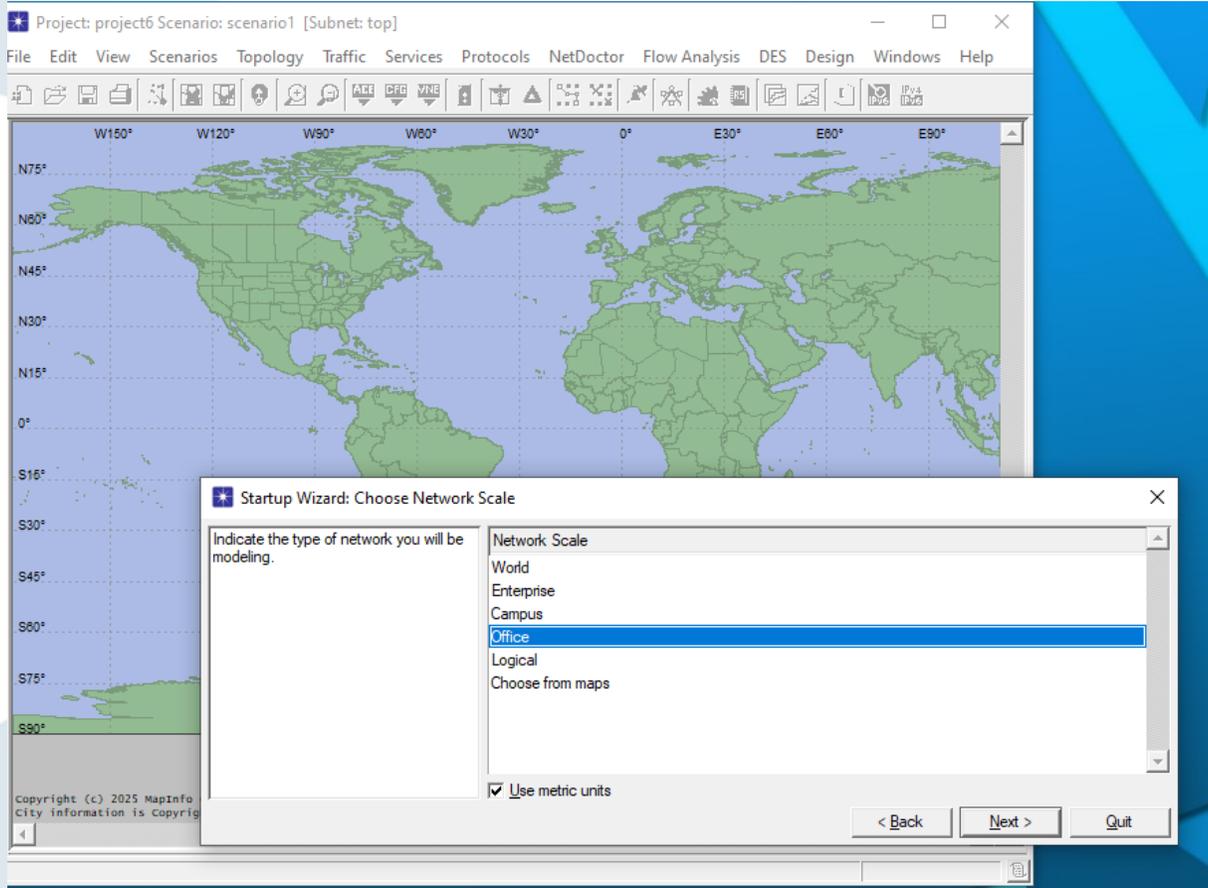


بداية نبدأ بفتح واجهة البرنامج الأساسية لإنشاء ملف جديد فتكون كما يلي



نقوم بإنشاء مشروع جديد ثم نختار إنشاء سيناريو فارغ لتوصيف مسألة العمل بداخلها





بعدها نختار حجم المكان الذي تمتد عليه  
الشبكة وفي حالتنا سنعمل على مساحة مكتب



## تمرين

قم بإنشاء شبكة مكتب تمتد على مساحة جغرافية 100 متر على المحور x و 100 متر على المحور y بحيث تتكون الشبكة من 10 حواسيب و switch موصولين بطريقة star ويتم ربطهم ب server مركزي لنقل الأصوات عبر الشبكة باعتماد تقنية (voip (pcm Quality مع الأخذ بعين الاعتبار التوصيلات بين الأجهزة و switch تعمل على سرعة 10mb/s و التوصيل بين switch و server بسرعة 100mb/s مع افتراض أن الكابلات من نوع twisted pairs نمط التوصيل ضمن الشبكة سيكون باستخدام ethernet.



# المساحة التي تتوزع عليها شبكة المكتب

Startup Wizard: Specify Size

Specify the units you wish to use (miles, kilometers, etc.) and the extent of your network.

Size:

X span: 100

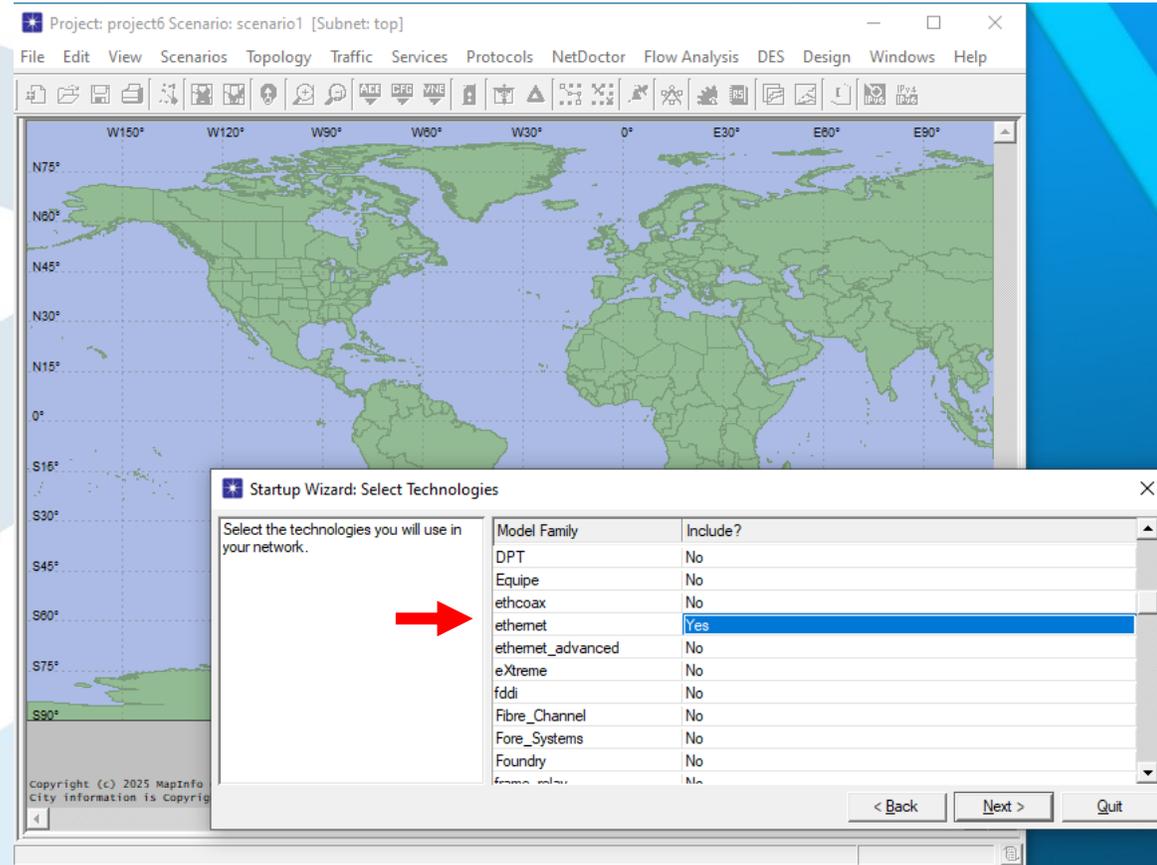
Y span: 100

Units: Meters

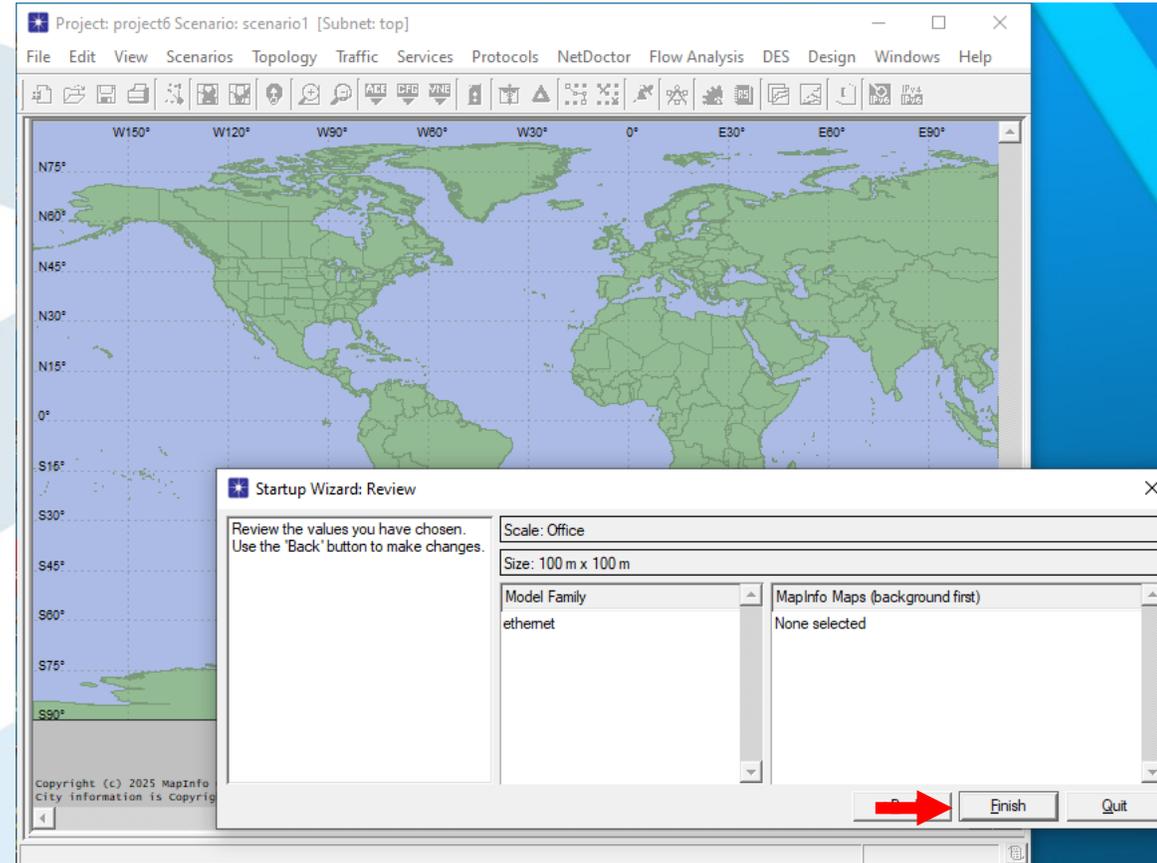
< Back Next > Quit



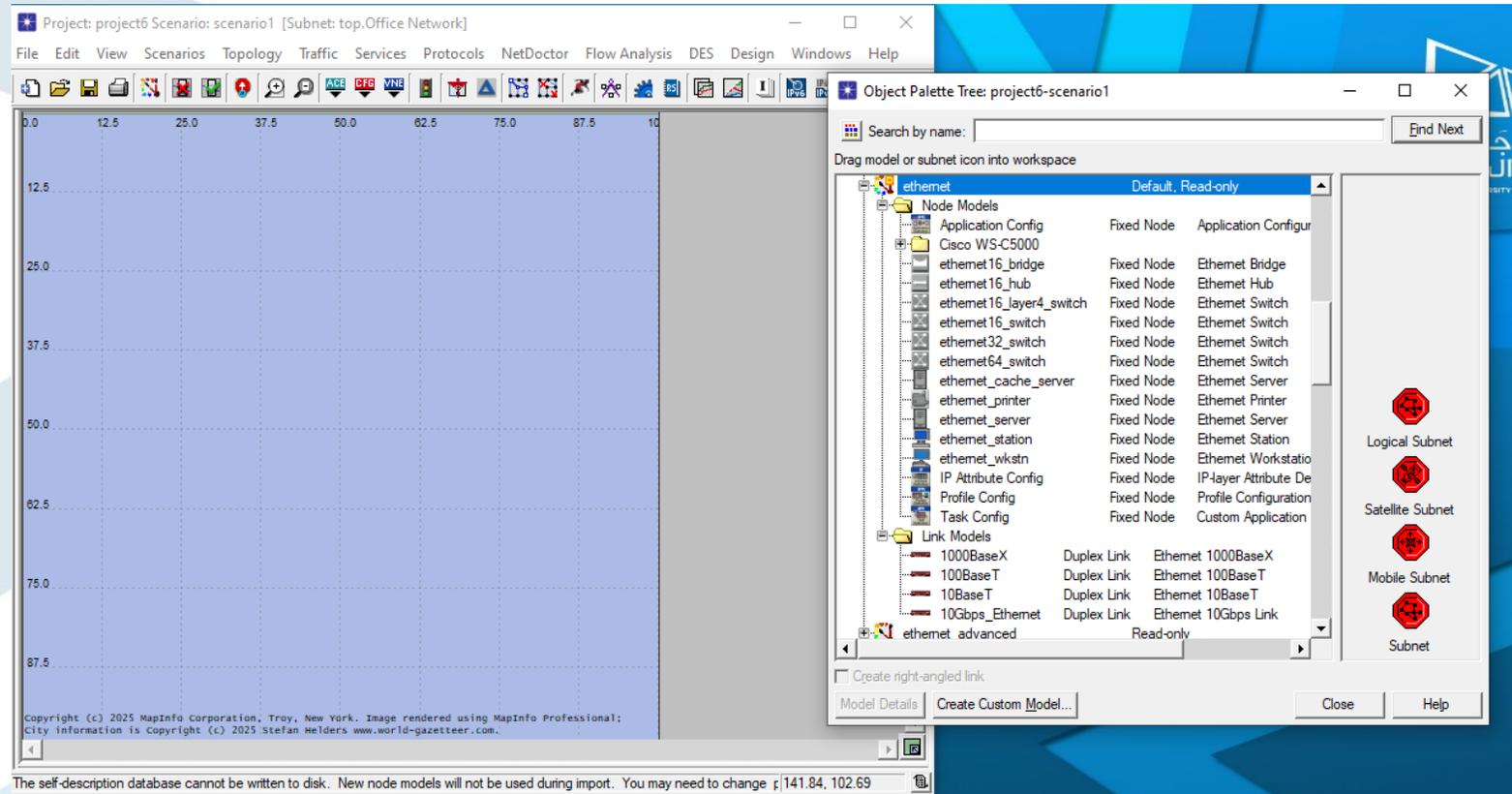
# اختيار تكنولوجيا النقل Ethernet



# إنهاء إعداد بيانات الشبكة الأساسية



# مساحة العمل الأساسية لبدء تصميم الشبكة مع شجرة العناصر





نختار بداية من  
شجرة العناصر من  
ethernet تبوية  
ال switch الذي  
سنقوم بتوصيل  
التجهيزات الطرفية  
مع  
حيث سنختاره  
بسعة 16 طرفية

The screenshot displays the NetDoctor software interface. The main workspace shows a grid with a switch icon labeled 'node\_0' and a purple selection box. The Object Palette Tree on the right lists various network models under the 'ethernet' category. A red arrow points to the 'ethernet16\_switch' model, which is highlighted in blue. The status bar at the bottom indicates 'Defining new object. [ethernet16\_switch]' and the IP address '108.83, 102.11'.

Model Name	Type	Category
Application Config	Fixed Node	Application Configur
Cisco WS-C5000	Fixed Node	Ethernet Bridge
ethernet16_bridge	Fixed Node	Ethernet Hub
ethernet16_hub	Fixed Node	Ethernet Switch
ethernet16_layer4_switch	Fixed Node	Ethernet Switch
ethernet16_switch	Fixed Node	Ethernet Switch
ethernet32_switch	Fixed Node	Ethernet Switch
ethernet64_switch	Fixed Node	Ethernet Switch
ethernet_cache_server	Fixed Node	Ethernet Server
ethernet_printer	Fixed Node	Ethernet Printer
ethernet_server	Fixed Node	Ethernet Server
ethernet_station	Fixed Node	Ethernet Station
ethernet_wkstn	Fixed Node	Ethernet Workstation
IP Attribute Config	Fixed Node	IP-layer Attribute De
Profile Config	Fixed Node	Profile Configuration
Task Config	Fixed Node	Custom Application
1000BaseX	Duplex Link	Ethernet 1000BaseX
100BaseT	Duplex Link	Ethernet 100BaseT
10BaseT	Duplex Link	Ethernet 10BaseT
10Gbps_Ethernet	Duplex Link	Ethernet 10Gbps Link





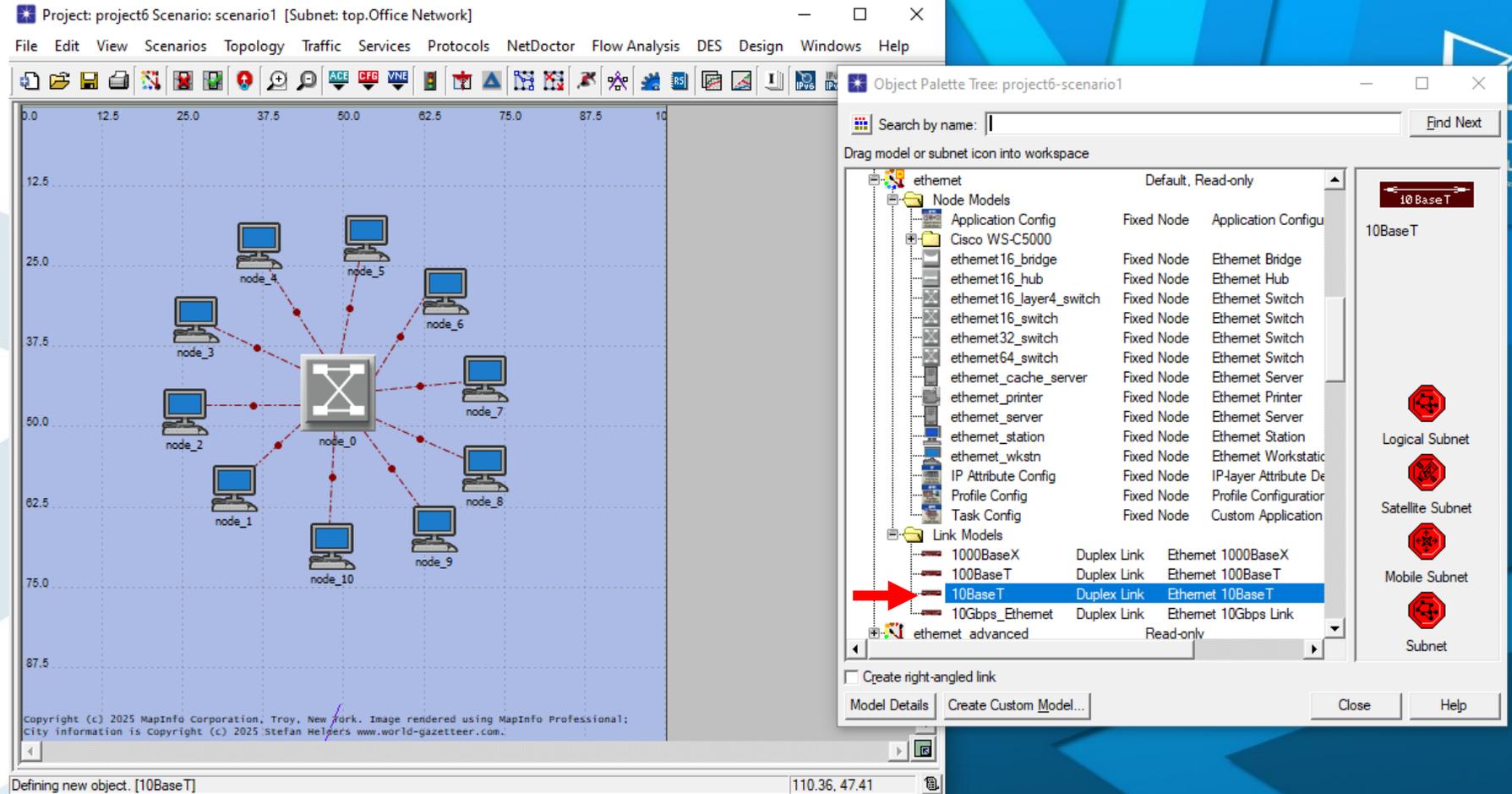
ثم نختار الطرفيات  
و التي عددها 10  
ذات مواقع ثابت  
جغرافيا.

The screenshot displays a network design software interface. The main workspace shows a network topology with 10 nodes (node\_0 to node\_10) and a central switch (node\_0). The interface includes a menu bar (File, Edit, View, Scenarios, Topology, Traffic, Services, Protocols, NetDoctor, Flow Analysis, DES, Design, Windows, Help) and a toolbar. An 'Object Palette Tree' window is open on the right, showing a list of network models. A red arrow points to the 'ethernet\_wkstn' model in the 'ethernet' category. The status bar at the bottom indicates 'Defining new object. [ethernet\_wkstn]' and coordinates '110,36, 47,41'.

Model Name	Type	Category
ethernet	Default, Read-only	
Node Models		
Application Config	Fixed Node	Application Configur
Cisco WS-C5000		
ethernet16_bridge	Fixed Node	Ethernet Bridge
ethernet16_hub	Fixed Node	Ethernet Hub
ethernet16_layer4_switch	Fixed Node	Ethernet Switch
ethernet16_switch	Fixed Node	Ethernet Switch
ethernet32_switch	Fixed Node	Ethernet Switch
ethernet64_switch	Fixed Node	Ethernet Switch
ethernet_cache_server	Fixed Node	Ethernet Server
ethernet_printer	Fixed Node	Ethernet Printer
ethernet_server	Fixed Node	Ethernet Server
ethernet_station	Fixed Node	Ethernet Station
ethernet_wkstn	Fixed Node	Ethernet Workstation
IP Attribute Config	Fixed Node	IP-layer Attribute De
Profile Config	Fixed Node	Profile Configuration
Task Config	Fixed Node	Custom Application
Link Models		
1000BaseX	Duplex Link	Ethernet 1000BaseX
100BaseT	Duplex Link	Ethernet 100BaseT
10BaseT	Duplex Link	Ethernet 10BaseT
10Gbps_Ethernet	Duplex Link	Ethernet 10Gbps Link
ethernet_advanced	Read-only	



سنقوم بتوصيل  
الأجهزة بال  
switch عن طريق  
كابلات 10BaseT  
والتي تحقق سرعة  
الاتصال المطلوبة



Project: project6 Scenario: scenario1 [Subnet: top.Office Network]

File Edit View Scenarios Topology Traffic Services Protocols NetDoctor Flow Analysis DES Design Windows Help

Object Palette Tree: project6-scenario1

Search by name: | Find Next

Drag model or subnet icon into workspace

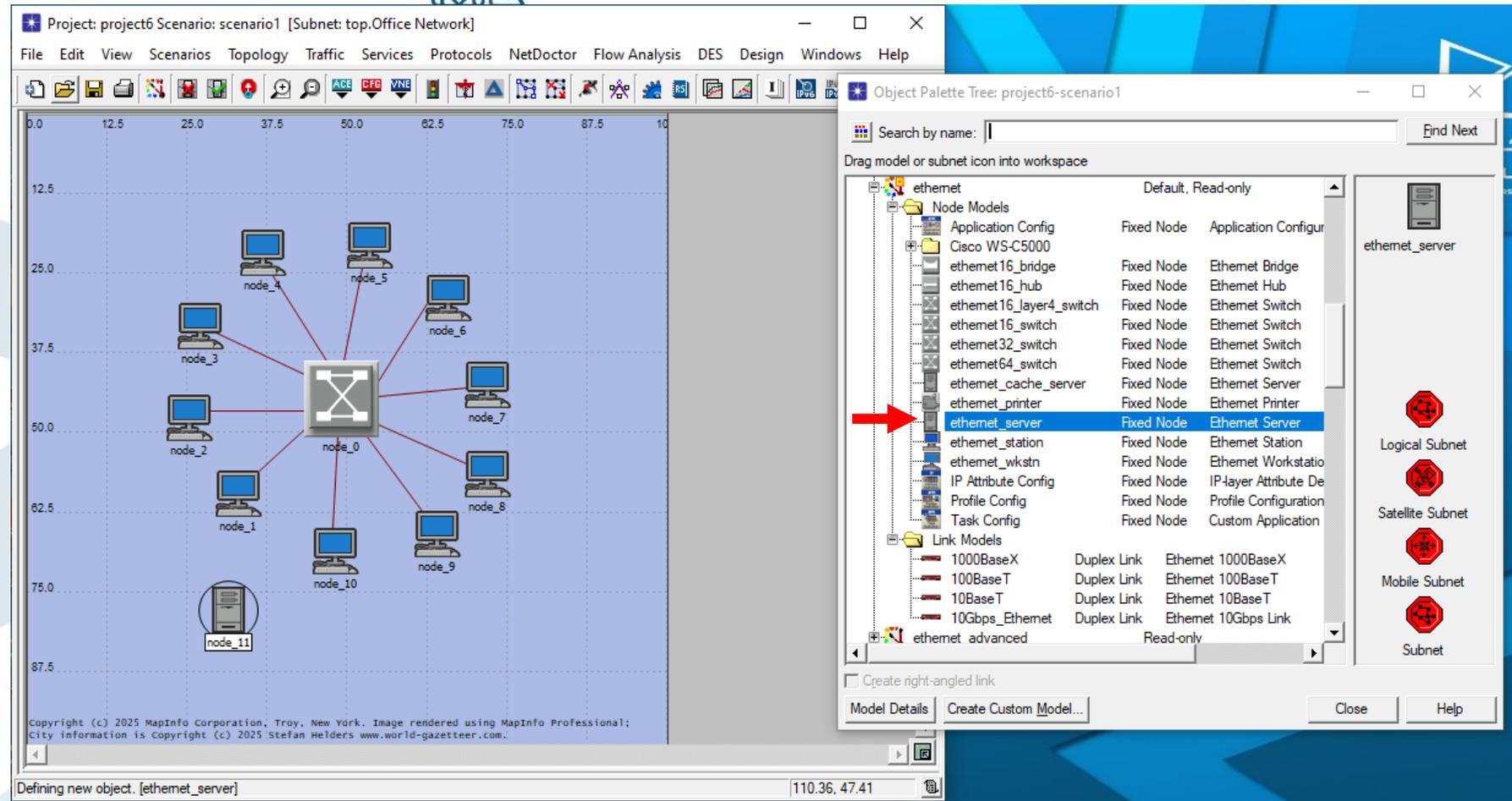
Model Name	Type	Category
ethernet	Default, Read-only	
Node Models		
Application Config	Fixed Node	Application Config
Cisco WS-C5000	Fixed Node	Ethernet Bridge
ethernet16_bridge	Fixed Node	Ethernet Hub
ethernet16_hub	Fixed Node	Ethernet Switch
ethernet16_layer4_switch	Fixed Node	Ethernet Switch
ethernet16_switch	Fixed Node	Ethernet Switch
ethernet32_switch	Fixed Node	Ethernet Switch
ethernet64_switch	Fixed Node	Ethernet Switch
ethernet_cache_server	Fixed Node	Ethernet Server
ethernet_printer	Fixed Node	Ethernet Printer
ethernet_server	Fixed Node	Ethernet Server
ethernet_station	Fixed Node	Ethernet Station
ethernet_wkstn	Fixed Node	Ethernet Workstation
IP Attribute Config	Fixed Node	IP-layer Attribute De
Profile Config	Fixed Node	Profile Configuration
Task Config	Fixed Node	Custom Application
Link Models		
1000BaseX	Duplex Link	Ethernet 1000BaseX
100BaseT	Duplex Link	Ethernet 100BaseT
10BaseT	Duplex Link	Ethernet 10BaseT
10Gbps_Ethernet	Duplex Link	Ethernet 10Gbps Link
ethernet advanced	Read-only	

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City information is Copyright (c) 2025 Stefan Helders www.world-gazetteer.com.

Defining new object. [10BaseT] [110.36, 47.41]



لاحقا نختار  
السيرفر الذي  
سنحدد عليه الخدمة  
التي نقدمها لهذه  
الشبكة.



Project: project6 Scenario: scenario1 [Subnet: top.Office Network]

File Edit View Scenarios Topology Traffic Services Protocols NetDoctor Flow Analysis DES Design Windows Help

Object Palette Tree: project6-scenario1

Search by name: | Find Next

Drag model or subnet icon into workspace

ethernet		Default, Read-only
Node Models		
Application Config	Fixed Node	Application Configur
Cisco WS-C5000		
ethernet16_bridge	Fixed Node	Ethernet Bridge
ethernet16_hub	Fixed Node	Ethernet Hub
ethernet16_layer4_switch	Fixed Node	Ethernet Switch
ethernet16_switch	Fixed Node	Ethernet Switch
ethernet32_switch	Fixed Node	Ethernet Switch
ethernet64_switch	Fixed Node	Ethernet Switch
ethernet_cache_server	Fixed Node	Ethernet Server
ethernet_printer	Fixed Node	Ethernet Printer
ethernet_server	Fixed Node	Ethernet Server
ethernet_station	Fixed Node	Ethernet Station
ethernet_wkstn	Fixed Node	Ethernet Workstatio
IP Attribute Config	Fixed Node	IP-layer Attribute De
Profile Config	Fixed Node	Profile Configuration
Task Config	Fixed Node	Custom Application
Link Models		
1000BaseX	Duplex Link	Ethernet 1000BaseX
100BaseT	Duplex Link	Ethernet 100BaseT
10BaseT	Duplex Link	Ethernet 10BaseT
10Gbps_Ethernet	Duplex Link	Ethernet 10Gbps Link
ethernet advanced	Read-only	

ethernet\_server

Logical Subnet

Satellite Subnet

Mobile Subnet

Subnet

Model Details Create Custom Model...

Close Help

Defining new object. [ethernet\_server] 110.36, 47.41



Project: project6 Scenario: scenario1 [Subnet: top.Office Network]

File Edit View Scenarios Topology Traffic Services Protocols NetDoctor Flow Analysis DES Design Windows Help

Object Palette Tree: project6-scenario1

Search by name: | Find Next

Drag model or subnet icon into workspace

Node Models		Default, Read-only	
Application Config	Fixed Node	Application Config	
Cisco WS-C5000			
ethernet16_bridge	Fixed Node	Ethernet Bridge	
ethernet16_hub	Fixed Node	Ethernet Hub	
ethernet16_layer4_switch	Fixed Node	Ethernet Switch	
ethernet16_switch	Fixed Node	Ethernet Switch	
ethernet32_switch	Fixed Node	Ethernet Switch	
ethernet64_switch	Fixed Node	Ethernet Switch	
ethernet_cache_server	Fixed Node	Ethernet Server	
ethernet_printer	Fixed Node	Ethernet Printer	
ethernet_server	Fixed Node	Ethernet Server	
ethernet_station	Fixed Node	Ethernet Station	
ethernet_wkstn	Fixed Node	Ethernet Workstation	
IP Attribute Config	Fixed Node	IP-layer Attribute De	
Profile Config	Fixed Node	Profile Configuration	
Task Config	Fixed Node	Custom Application	

Link Models		Default, Read-only	
1000BaseX	Duplex Link	Ethernet 1000BaseX	
100BaseT	Duplex Link	Ethernet 100BaseT	
10BaseT	Duplex Link	Ethernet 10BaseT	
10Gbps_Ethernet	Duplex Link	Ethernet 10Gbps Link	

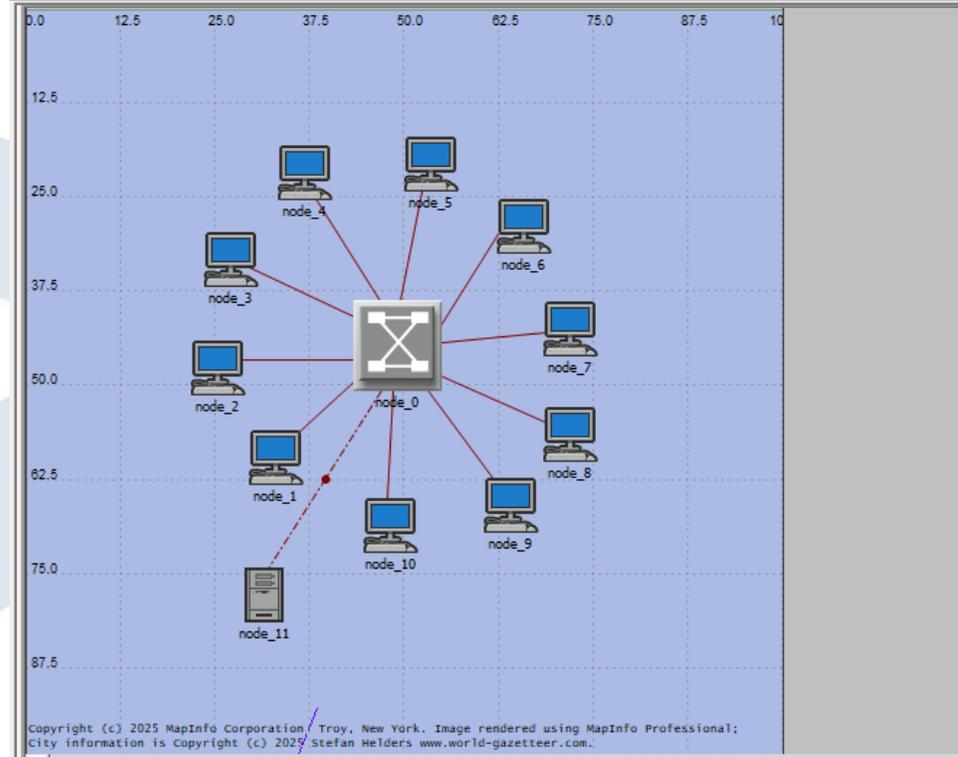
ethernet advanced Read-only

Create right-angled link

Model Details Create Custom Model...

Close Help

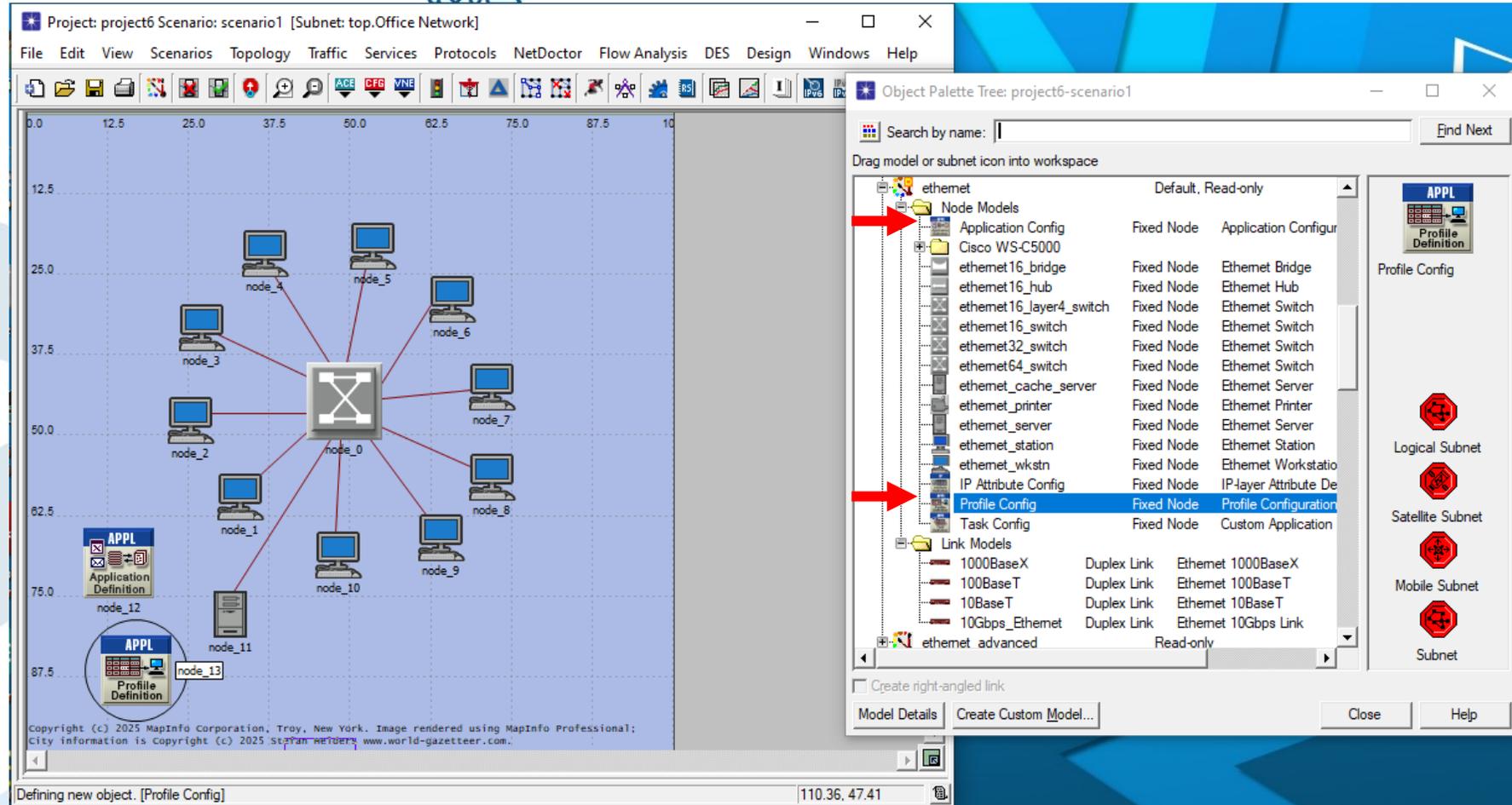
Defining new object. [100BaseT] 110.36, 47.41



بعد وضع السيرفر  
يجب القيام بوصله  
مع switch الشبكة  
و بالتالي نختاره  
ليحقق السرعة  
المطلوبة  
100BaseT



لتحديد الخدمة  
المفعلة و إنشاء  
بروفايل خدمة معين  
نحتاج لكل من  
profile, معرفات  
Appliction



The screenshot displays a network configuration application window titled "Project: project6 Scenario: scenario1 [Subnet: top.Office Network]". The main workspace shows a network topology with a central switch (node\_0) connected to several client nodes (node\_1 to node\_13). Two "APPL" icons are visible: "Application Definition" and "Profile Definition".

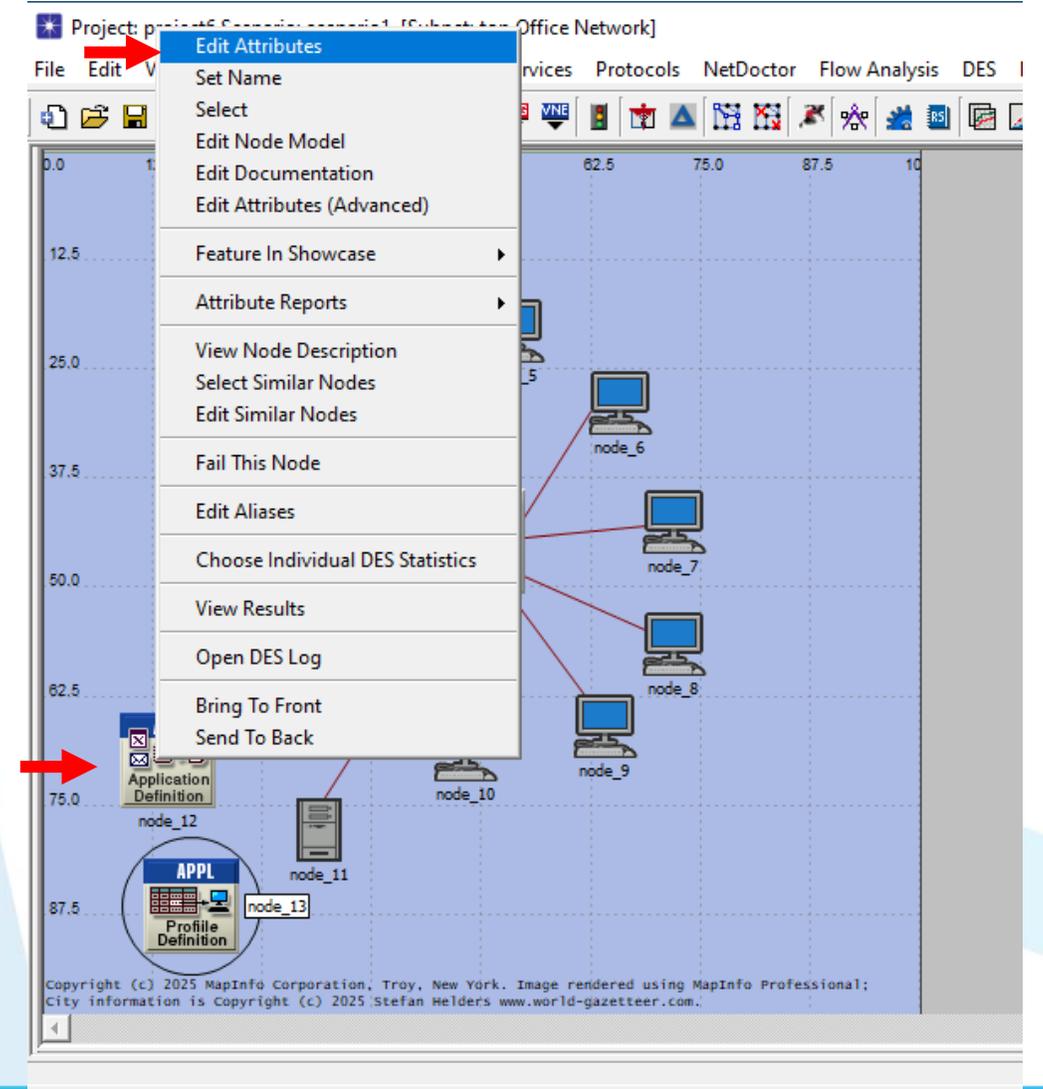
An "Object Palette Tree" window is open on the right, showing a list of network models and configurations. The "Profile Config" item is highlighted, and a red arrow points to it. The palette also shows "Node Models" and "Link Models".

Model Name	Type	Category
Application Config	Fixed Node	Application Configur
Cisco WS-C5000	Fixed Node	Ethernet Bridge
ethernet_16_bridge	Fixed Node	Ethernet Hub
ethernet_16_hub	Fixed Node	Ethernet Switch
ethernet_16_layer4_switch	Fixed Node	Ethernet Switch
ethernet_16_switch	Fixed Node	Ethernet Switch
ethernet_32_switch	Fixed Node	Ethernet Switch
ethernet64_switch	Fixed Node	Ethernet Server
ethernet_cache_server	Fixed Node	Ethernet Server
ethernet_printer	Fixed Node	Ethernet Printer
ethernet_server	Fixed Node	Ethernet Server
ethernet_station	Fixed Node	Ethernet Station
ethernet_wkstn	Fixed Node	Ethernet Workstation
IP Attribute Config	Fixed Node	IP-layer Attribute De
Profile Config	Fixed Node	Profile Configuration
Task Config	Fixed Node	Custom Application
1000BaseX	Duplex Link	Ethernet 1000BaseX
100BaseT	Duplex Link	Ethernet 100BaseT
10BaseT	Duplex Link	Ethernet 10BaseT
10Gbps_Ethernet	Duplex Link	Ethernet 10Gbps Link

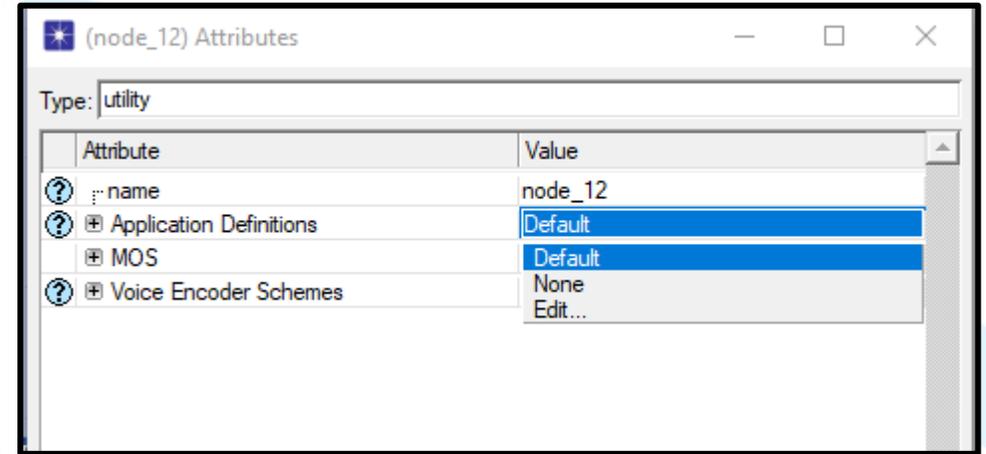
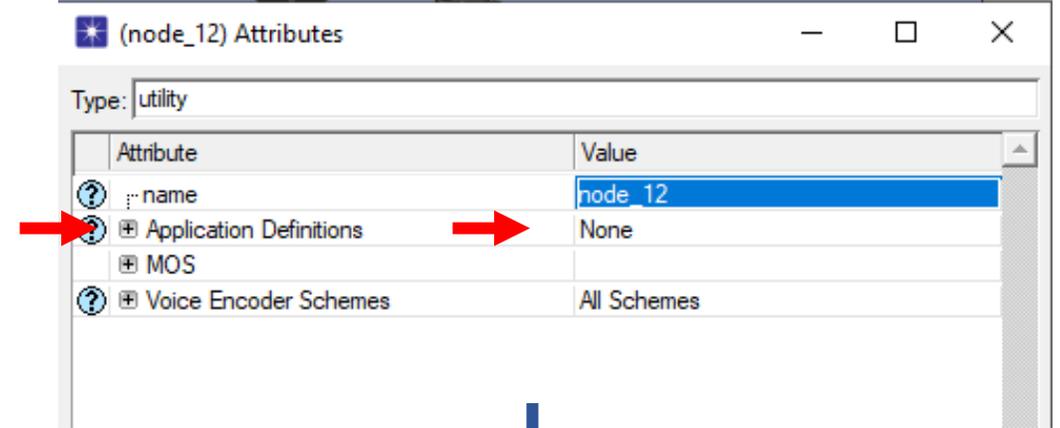
The status bar at the bottom indicates "Defining new object. [Profile Config]" and the coordinates "110.36, 47.41".



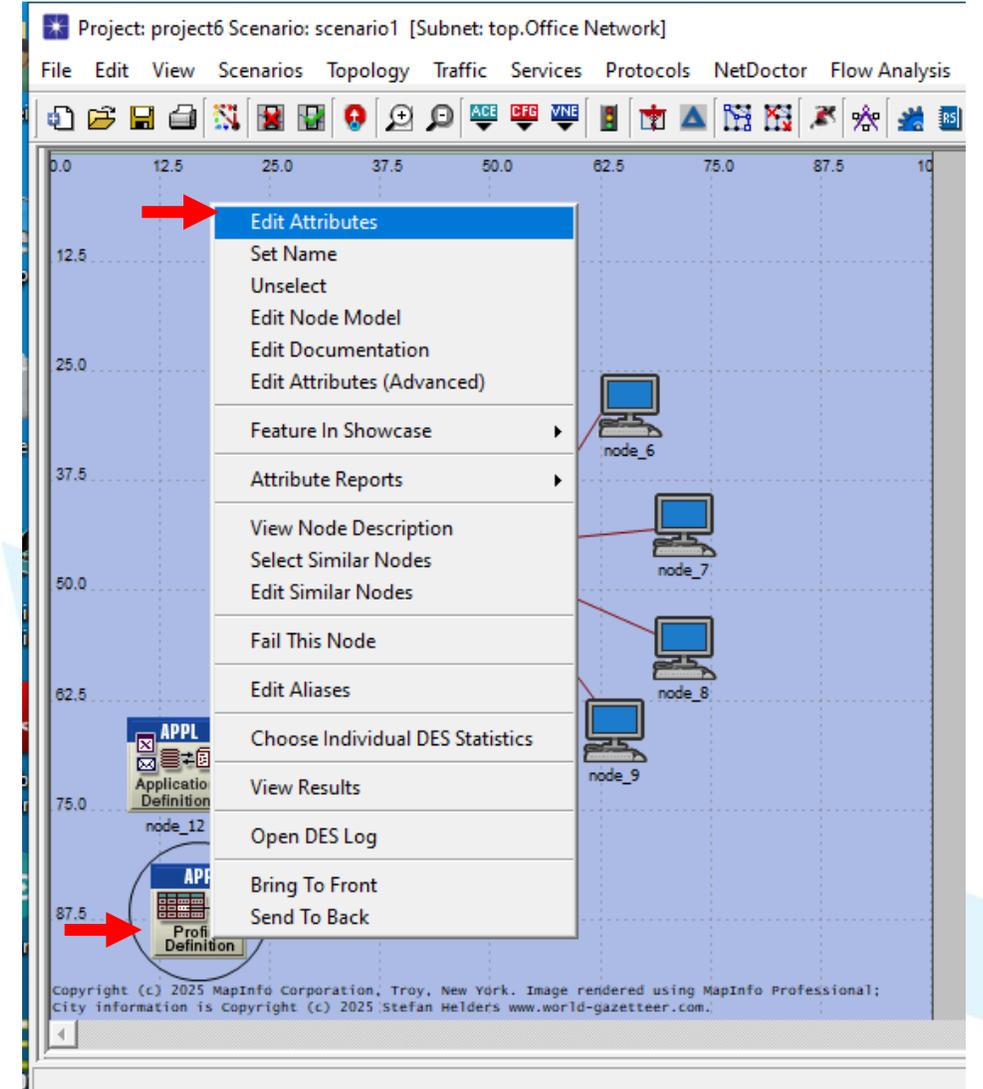
بداية نحدد Application Configuration  
من خلال النقر بالزر اليميني على الأيقونة  
الخاصة به ثم نختار Edit Attributes  
لتحرير الخصائص



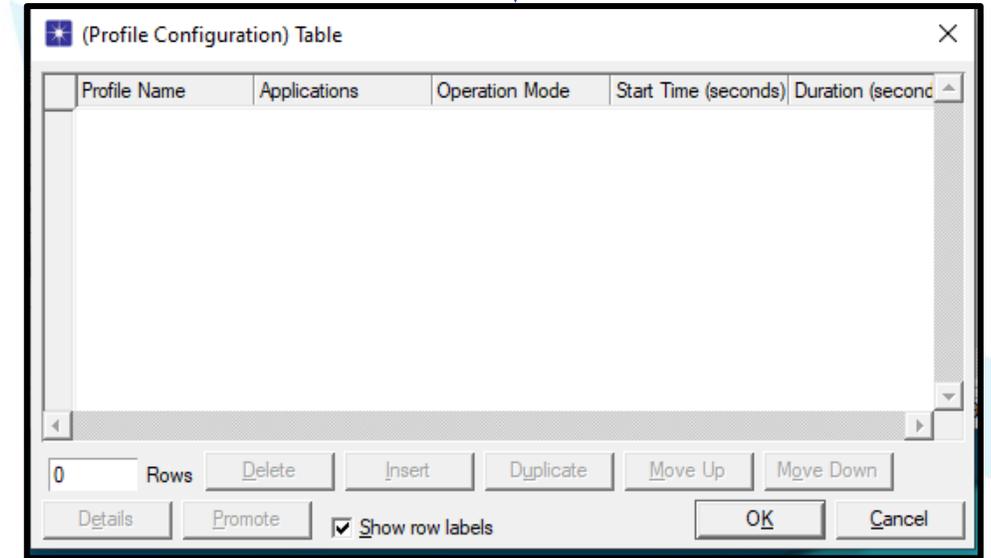
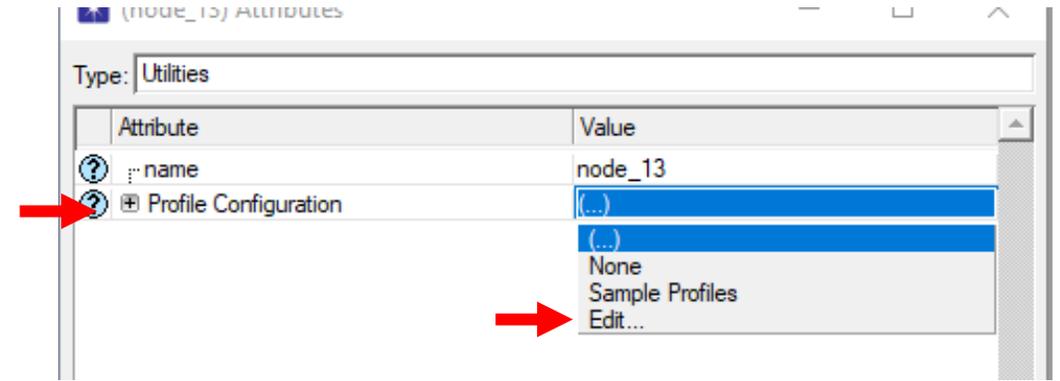
تفتح النافذة التالية و المعرفة بـ  
None من نمط Application Defintions  
و التي علينا وضعها Default لإتاحة خدمات  
النقل المختلفة الافتراضية



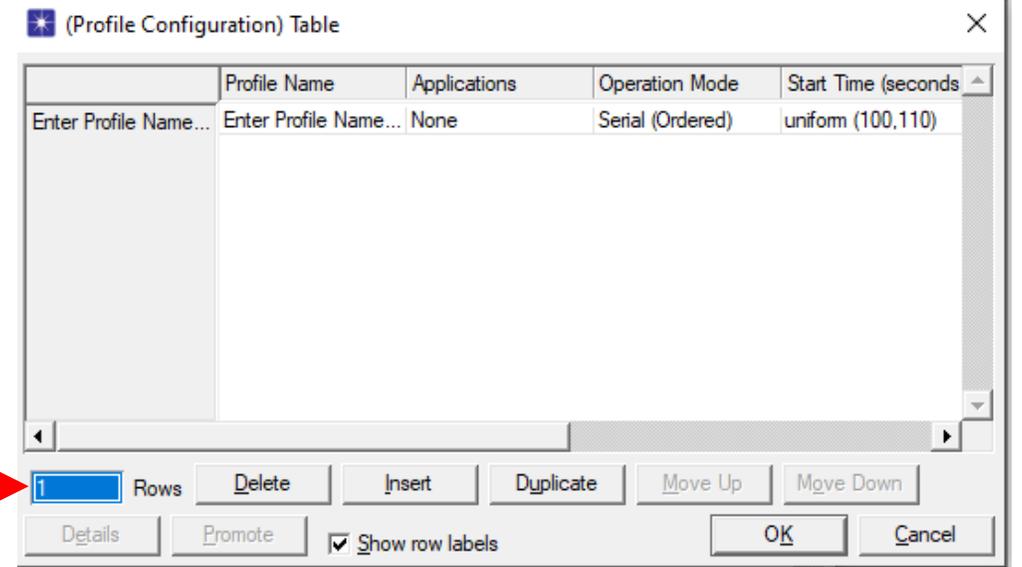
ثم نحدد Profile Configuration من خلال  
النقر بالزر اليميني على الأيقونة الخاصة به  
ثم نختار Edit Attributes لتحرير  
الخصائص



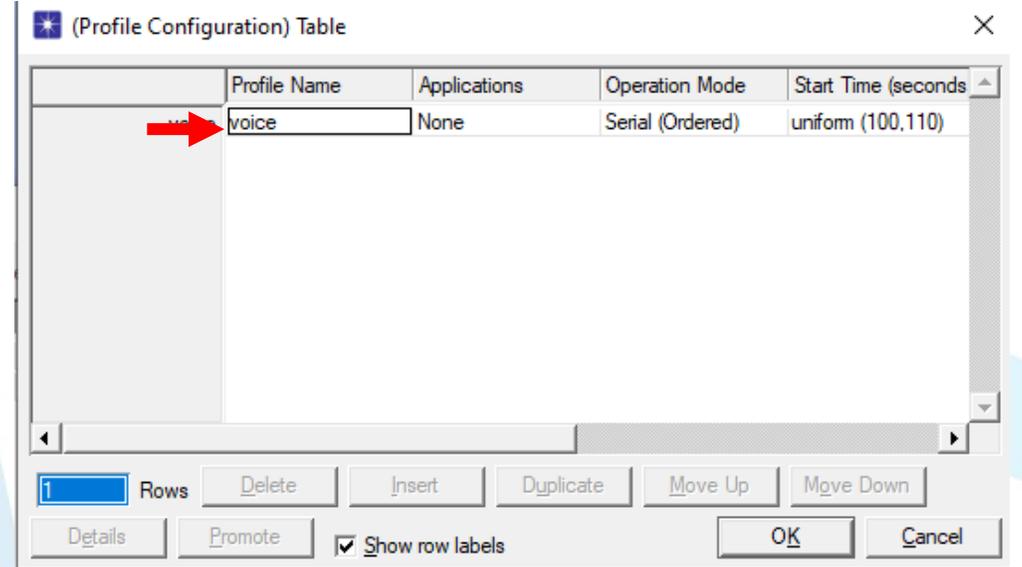
تفتح النافذة التالية و المعرفة ب Profile Configuration من نمط None و التي علينا تحريرها من خلال edit لإنشاء اسم للخدمة وتعريفها.



نضيف سطر من rows حتى نعطي للبروفایل اسم و تحديد التطبيق الذي سنطبق عليه.  
نعطي اسم للبروفایل مثلا voice ثم نختار التطبيق.



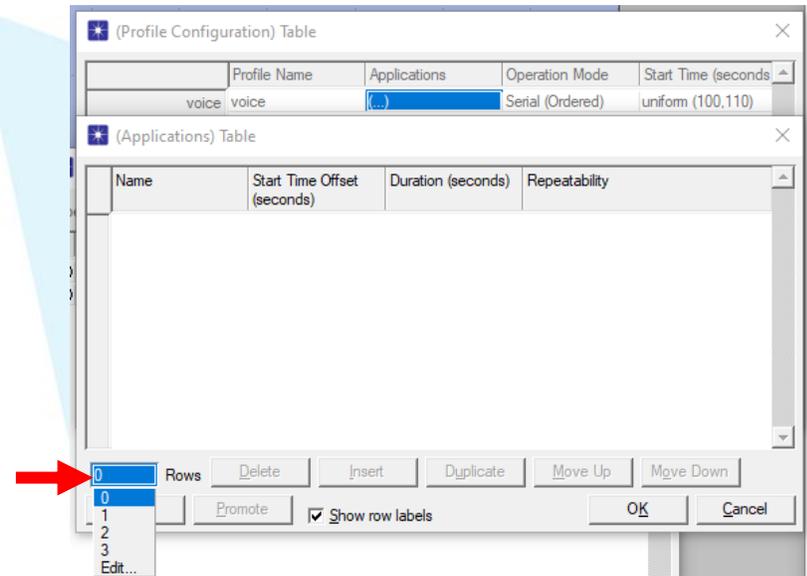
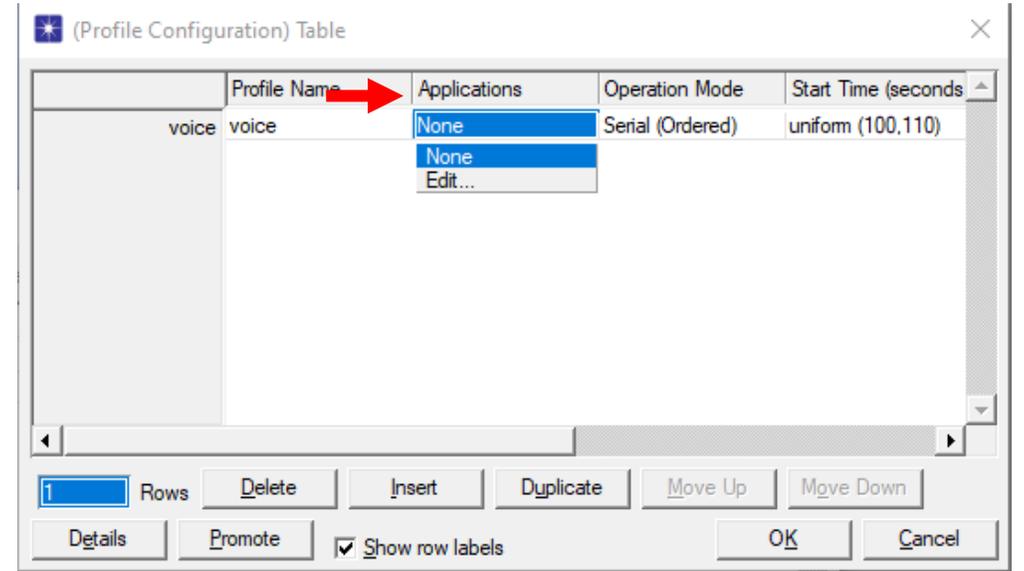
Profile Name	Applications	Operation Mode	Start Time (seconds)
Enter Profile Name...	None	Serial (Ordered)	uniform (100,110)



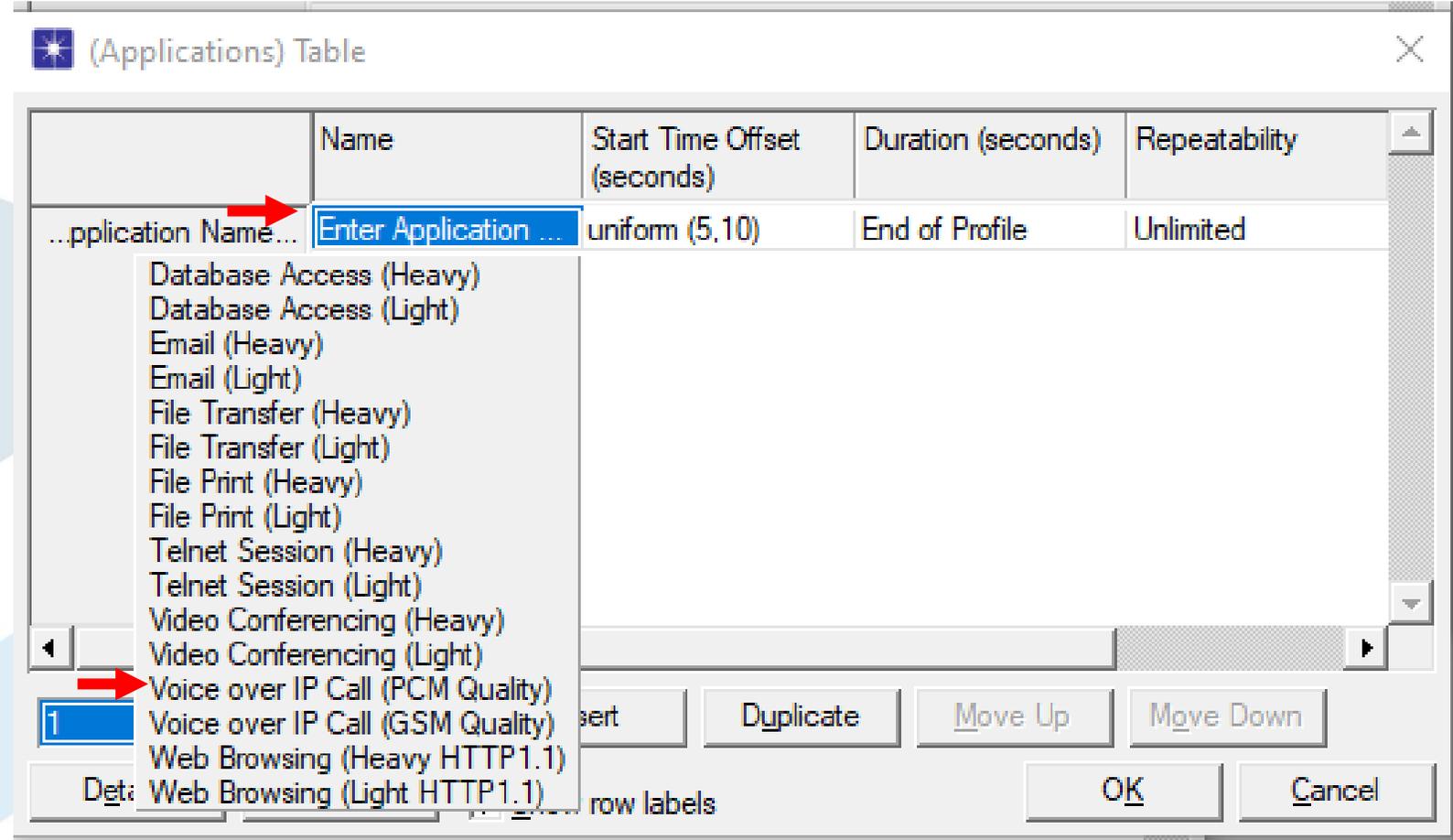
Profile Name	Applications	Operation Mode	Start Time (seconds)
voice	None	Serial (Ordered)	uniform (100,110)



نقرم بتحرير خانة التطبيق من خلال edit ثم  
نختار إضافة سطر من rows



عند اختيار اسم التطبيق تعطي  
القائمة المنسدلة مجموعة  
الخيارات للتطبيق الذي نريد نقله  
عبر الشبكة  
في حالتنا نريد نقل  
voice over IP call  
(PCM Quality)



ثم نحدد خيارات الوقت  
لعملية النقل والتي  
سنختارها بحيث تكون ثابتة  
و لمدة 10 ثواني ثم نعطي  
ok لتثبيت كافة الخيارات  
التي قمنا بها

... Call (PCM Quality) voice over IP Call (PCM Qua...

"Start Time Offset" Specification

Distribution name: constant

Mean outcome: 10

OK Cancel Help

(Profile Configuration) Table

Profile Name	Applications	Operation Mode	Start Time (seconds)
voice	voice	Serial (Ordered)	uniform (100,110)

(Applications) Table

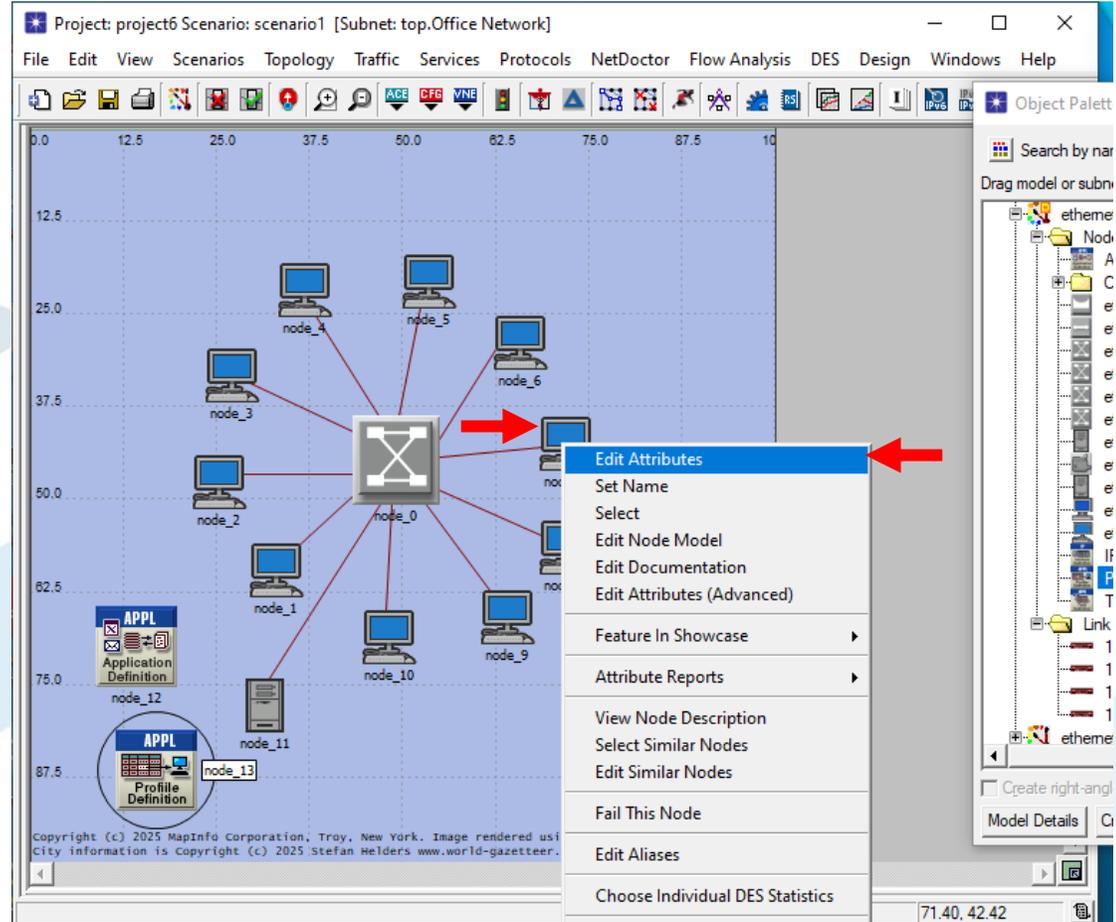
Name	Start Time Offset (seconds)	Duration (seconds)	Repeatable
... Call (PCM Quality) Voice over IP Call (PCM Qua...	uniform (5,10)	End of Profile	Unlimited

1 Rows Delete Insert Duplicate Move Up Move Down

Details Promote  Show row labels OK Cancel



لإعطاء الحواسيب الطرفية  
الواصفات الخاصة بعملية نقل  
الأصوات عبر الشبكة ننقر  
بالزر اليميني على الحاسب  
المراد معايرته ونختار تحرير  
خصائص edit attributes



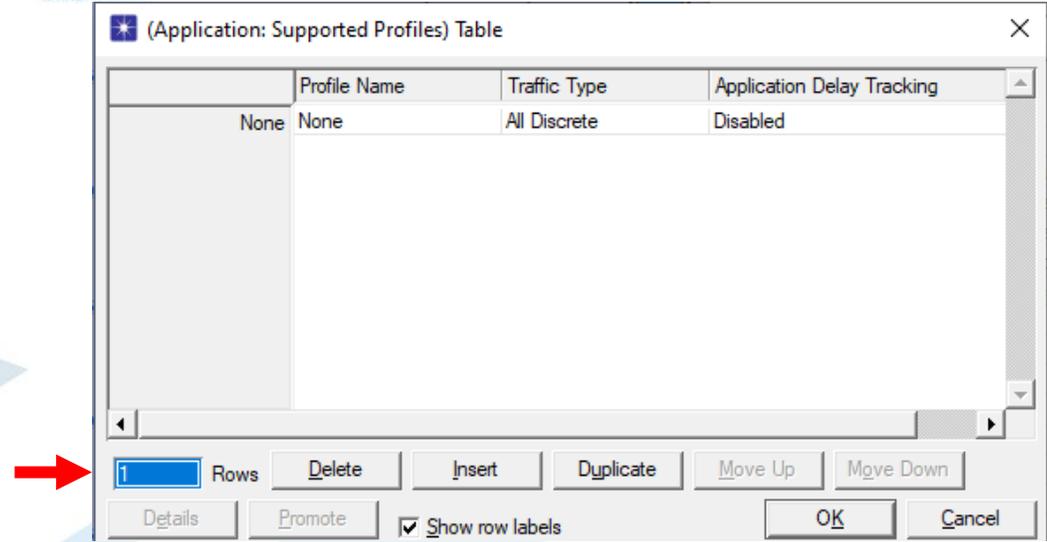
ضمن قائمة applications  
نختار البروفيلات المدعومة  
لهذا الجهاز من خلال  
application supported  
profiles  
ثم نقوم بتحريرها من خلال  
edit

The screenshot displays a network simulation environment. The main window shows a central switch (node\_0) connected to several workstation nodes (node\_1 to node\_13). A configuration window titled "(node\_7) Attributes" is open, showing a list of attributes and their values. The "Applications" section is expanded, and the "Application: Supported Profiles" attribute is highlighted with a red arrow pointing to its value, "None". Another red arrow points to the "Applications" header. The interface includes a menu bar, a toolbar, and an object palette on the right.

Attribute	Value
name	node_7
Applications	Unspecified
Application: ACE Tier Configuration	Unspecified
Application: Destination Preferences	None
Application: Supported Profiles	None
Application: Supported Services	None
Application: Transport Protocol Specific...	Edit...
H323	
CPU	
Client Address	Auto Assigned
VPN	
DHCP	
IP Multicasting	
IP	
NHRP	
Reports	
SIP	
Servers	
TCP	
L2TP	



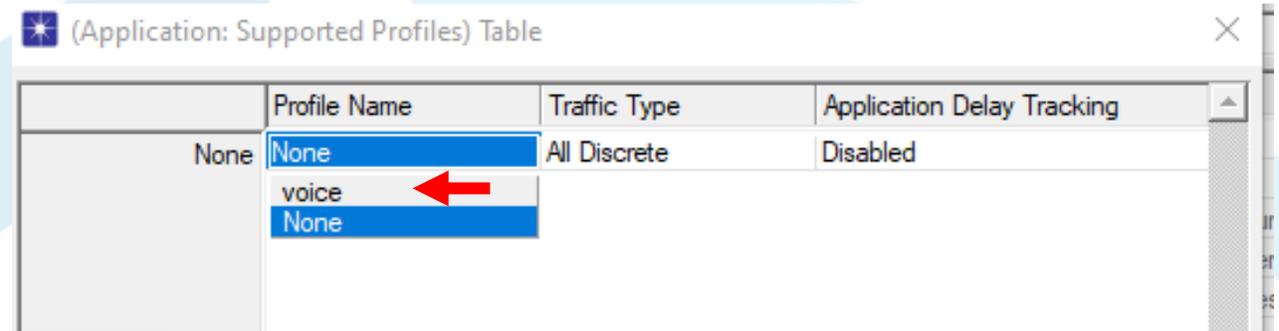
نقوم بإضافة سطر لتحديد  
البروفایل المرغوب و الذي  
قمنا بتعريفه ب voice سابقا



(Application: Supported Profiles) Table

	Profile Name	Traffic Type	Application Delay Tracking
None	None	All Discrete	Disabled

Buttons: Rows, Delete, Insert, Duplicate, Move Up, Move Down, Details, Promote, Show row labels, OK, Cancel



(Application: Supported Profiles) Table

	Profile Name	Traffic Type	Application Delay Tracking
None	None	All Discrete	Disabled
	voice		
	None		



نقوم بإضافة سطر لتحديد  
البروفایل المرغوب و الذي  
قمنا بتعريفه ب voice سابقا



(Application: Supported Profiles) Table

	Profile Name	Traffic Type	Application Delay Tracking
None	None	All Discrete	Disabled

Rows Delete Insert Duplicate Move Up Move Down  
Details Promote  Show row labels OK Cancel

(Application: Supported Profiles) Table

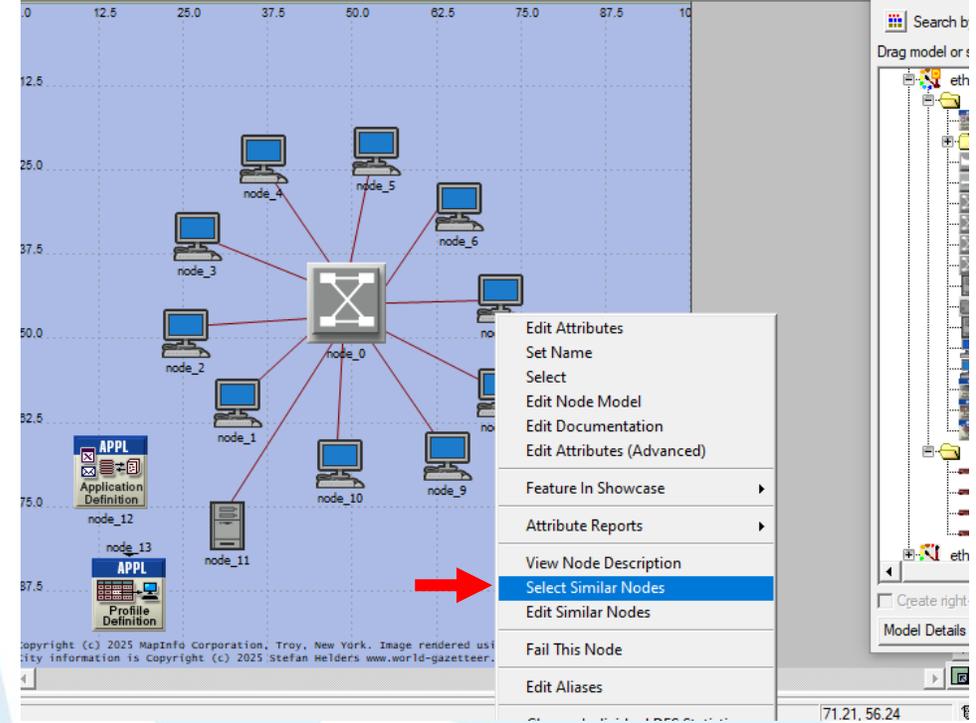
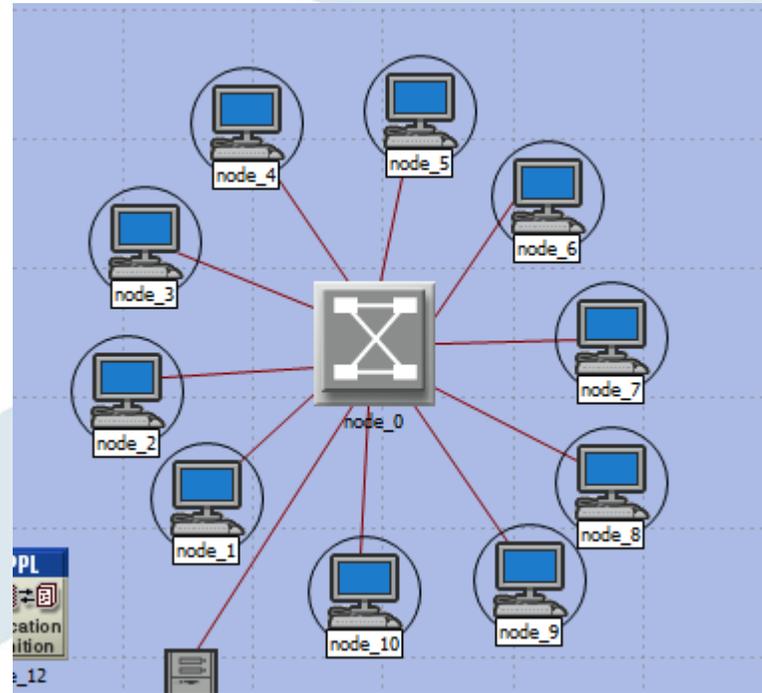
	Profile Name	Traffic Type	Application Delay Tracking
voice	voice	All Discrete	Disabled



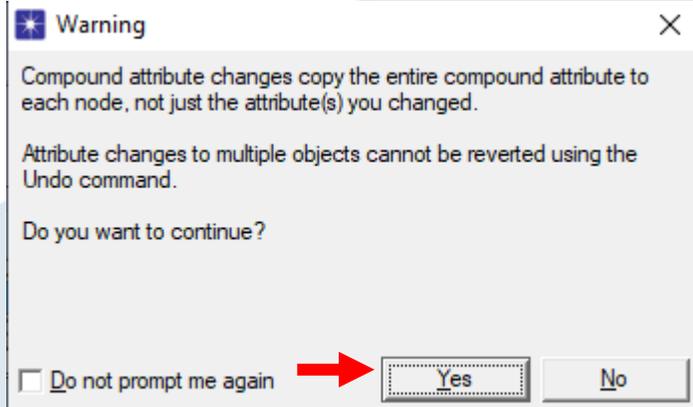
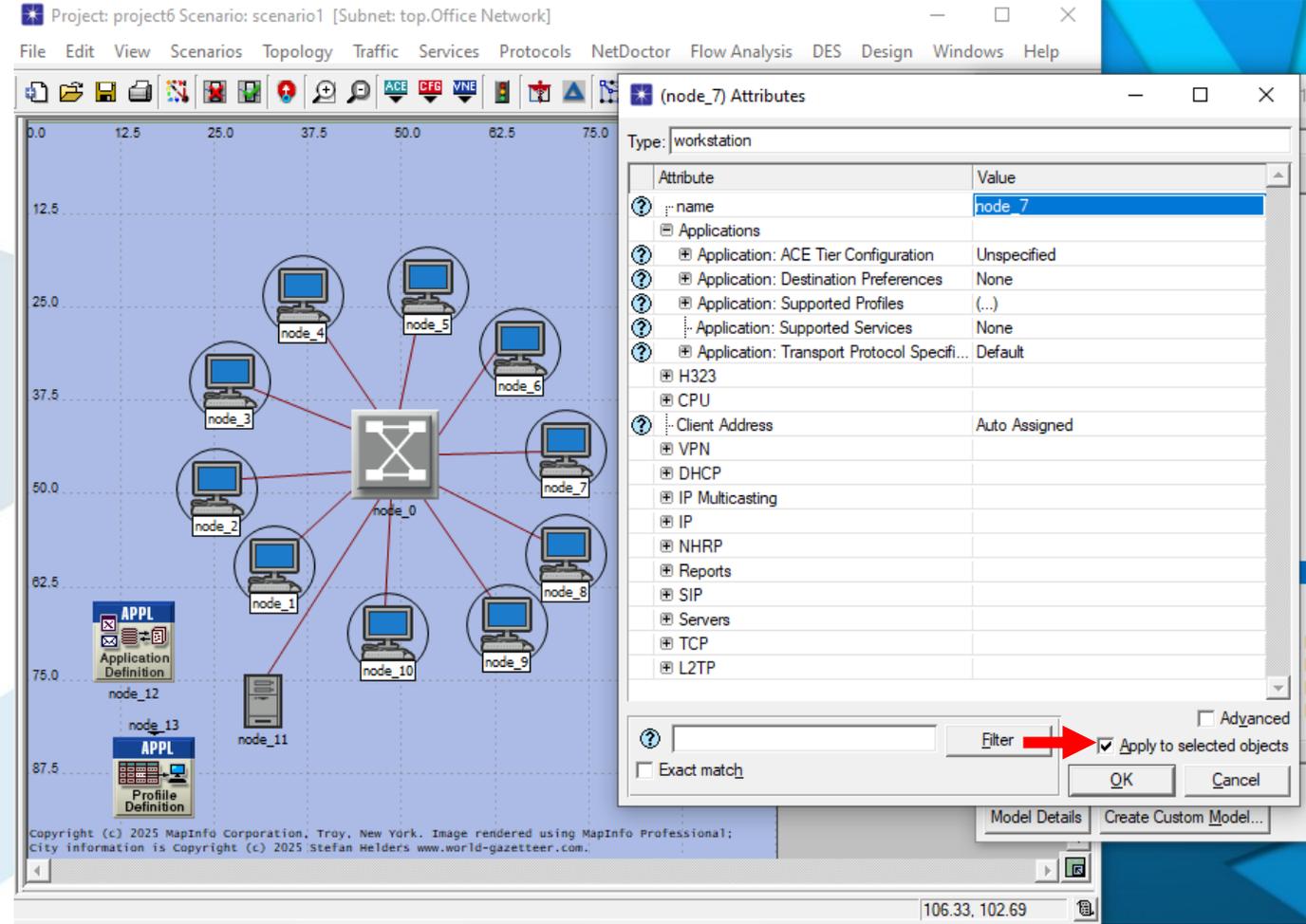
لنقوم بعملية تعريف البروفایل على كافة  
الحواسيب ننقر بالزر اليميني على أحدها ثم  
نختار تحديد كافة الأجهزة المشابهة

### Select Similar Nodes

فيتم تحديدها كلها ثم نقوم بإتباع نفس  
التعليمات السابقة لتعريف البروفایل



عند اختيار أجهزة متعددة من خلال  
Select Similar Nodes  
يجب الانتباه بعد تعيين الخصائص إلى  
تطبيقها على كافة الأجهزة من خلال  
Apply to Selected Objects  
مع تأكيد تطبيقها من خلال الخيار  
yes  
ضمن الـ Warning

Project: project6 Scenario: scenario1 [Subnet: top.Office Network]

File Edit View Scenarios Topology Traffic Services Protocols NetDoctor Flow Analysis DES Design Windows Help

(node\_7) Attributes

Type: workstation

Attribute	Value
name	node_7
Applications	
Application: ACE Tier Configuration	Unspecified
Application: Destination Preferences	None
Application: Supported Profiles	(...)
Application: Supported Services	None
Application: Transport Protocol Specific...	Default
H323	
CPU	
Client Address	Auto Assigned
VPN	
DHCP	
IP Multicasting	
IP	
NHRP	
Reports	
SIP	
Servers	
TCP	
L2TP	

Filter  Apply to selected objects

OK Cancel

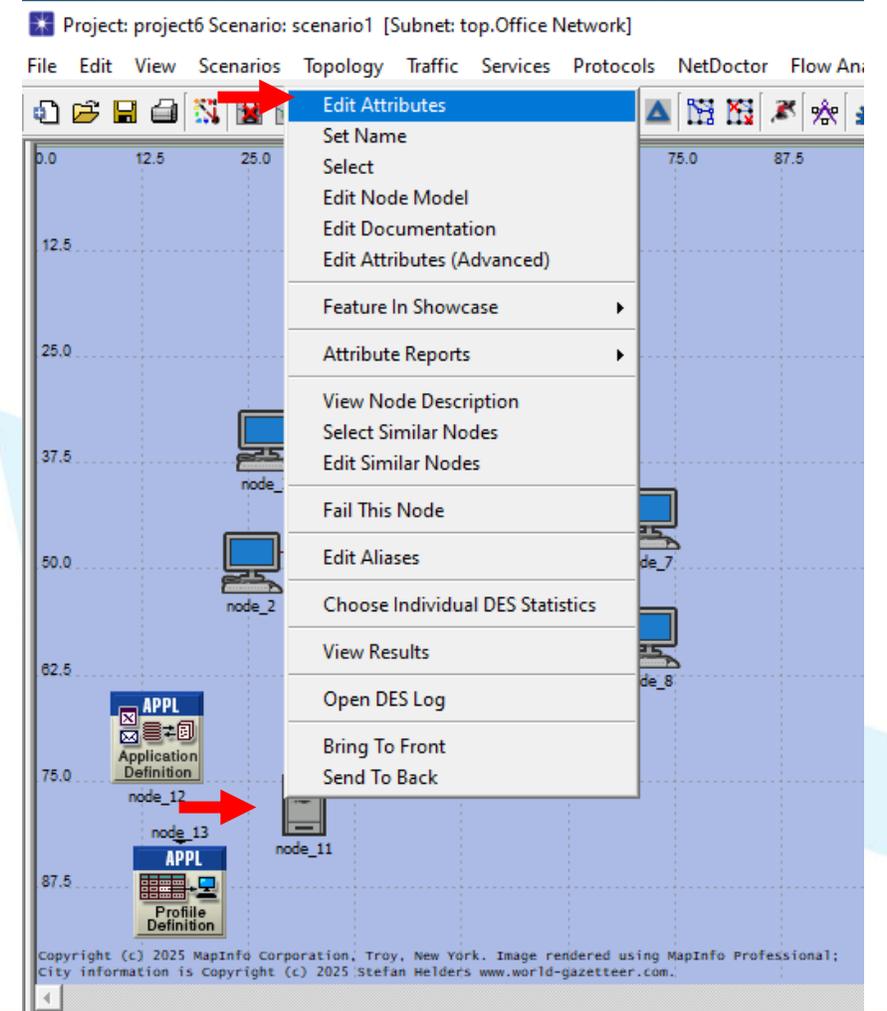
Model Details Create Custom Model...

Copyright (c) 2025 MapInfo Corporation, Troy, New York. Image rendered using MapInfo Professional; City information is Copyright (c) 2025 Stefan Helders www.world-gazetteer.com.

106.33.102.69



# لاعطاء السيرفر خيار الخدمة المناسب زر يميني ثم تحرير خصائص



(Application: Supported Services) Table

Name	Description
None	Supported
Database Access (Heavy)	
Database Access (Light)	
Email (Heavy)	
Email (Light)	
File Transfer (Heavy)	
File Transfer (Light)	
File Print (Heavy)	
File Print (Light)	
Telnet Session (Heavy)	
Telnet Session (Light)	
Video Conferencing (Heavy)	
Video Conferencing (Light)	
Voice over IP Call (PCM Quality)	
Voice over IP Call (GSM Quality)	
Web Browsing (Heavy HTTP1.1)	
Web Browsing (Light HTTP1.1)	

1 Rows

Details Promote Show row labels OK

(node\_11) Attributes

Type: server

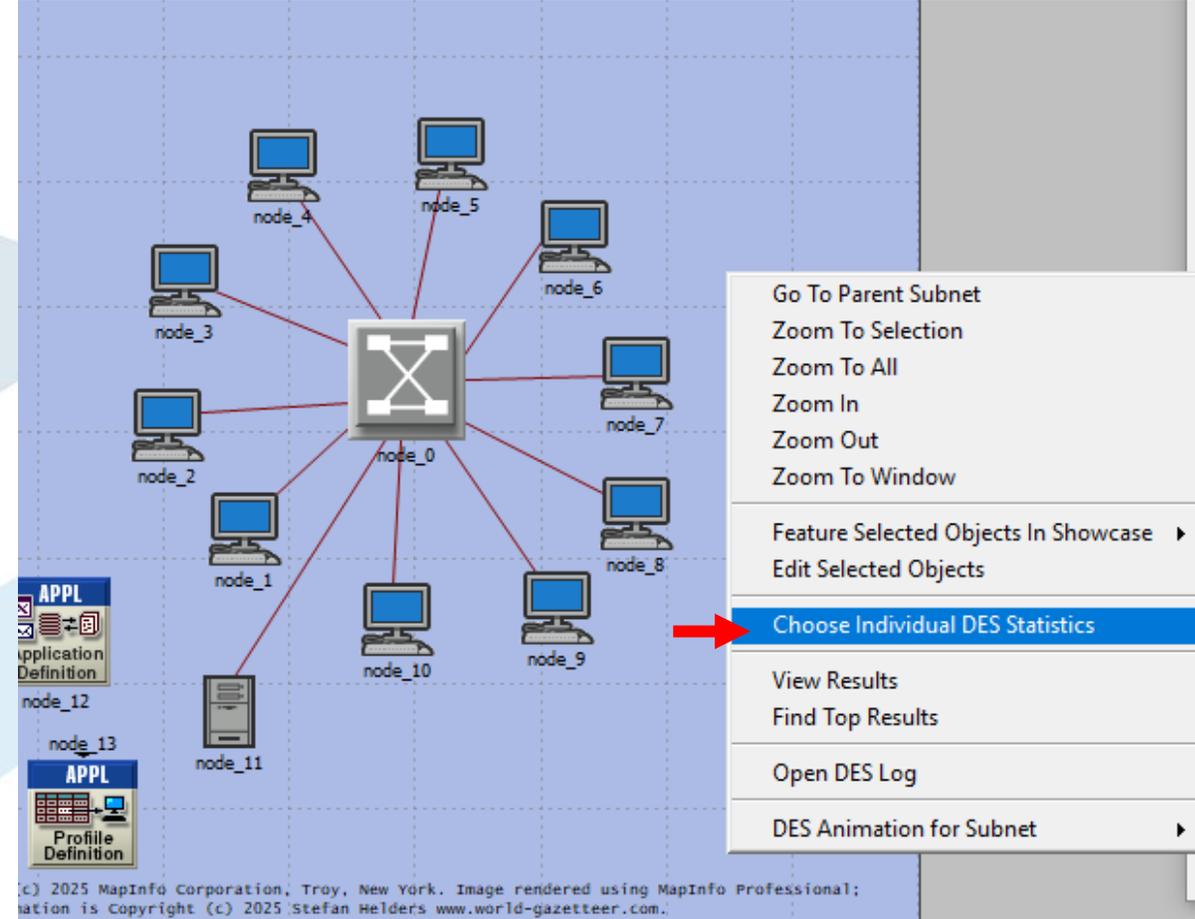
Attribute	Value
name	node_11
Applications	
Application: ACE Tier Configuration	Unspecified
Application: Destination Preferences	None
Application: Supported Profiles	None
Application: Supported Services	None
H323	None
CPU	All
VPN	Edit...
DHCP	
IP Multicasting	
IP	
MUDD	

(Application: Supported Services) Table

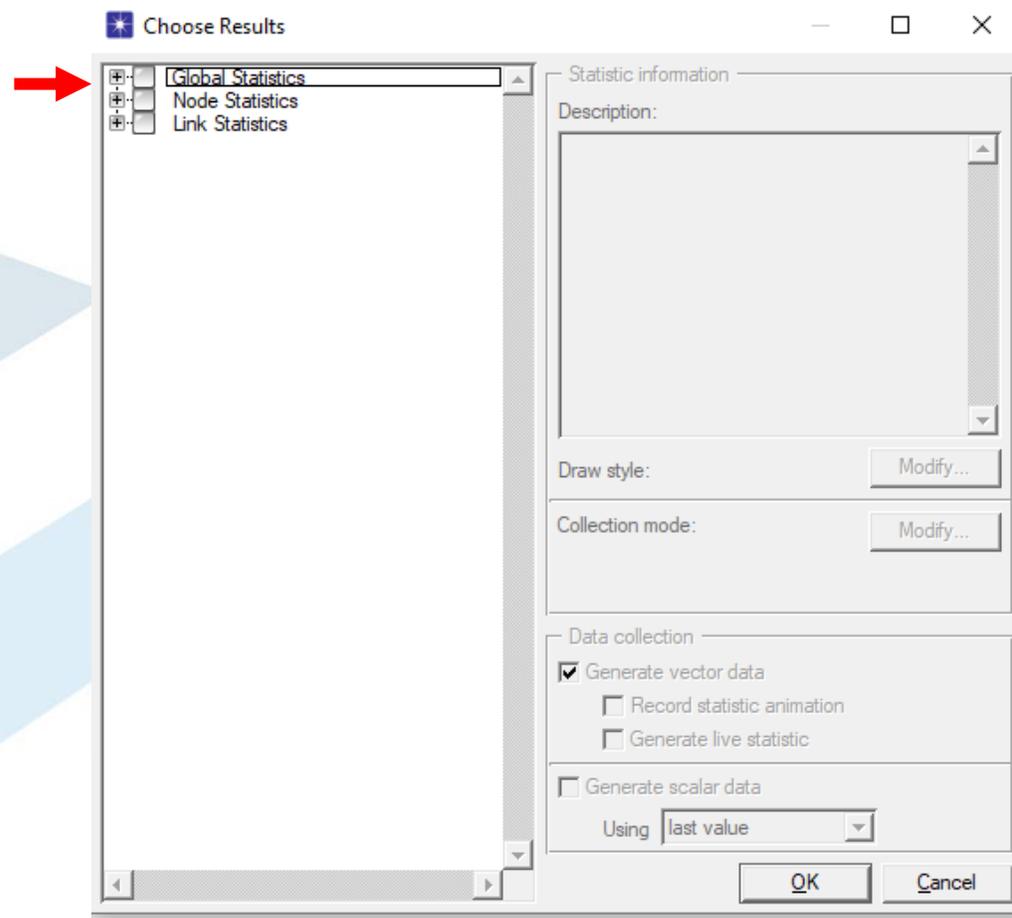
Name	Description
Voice over IP Call (PCM Quality)	Supported

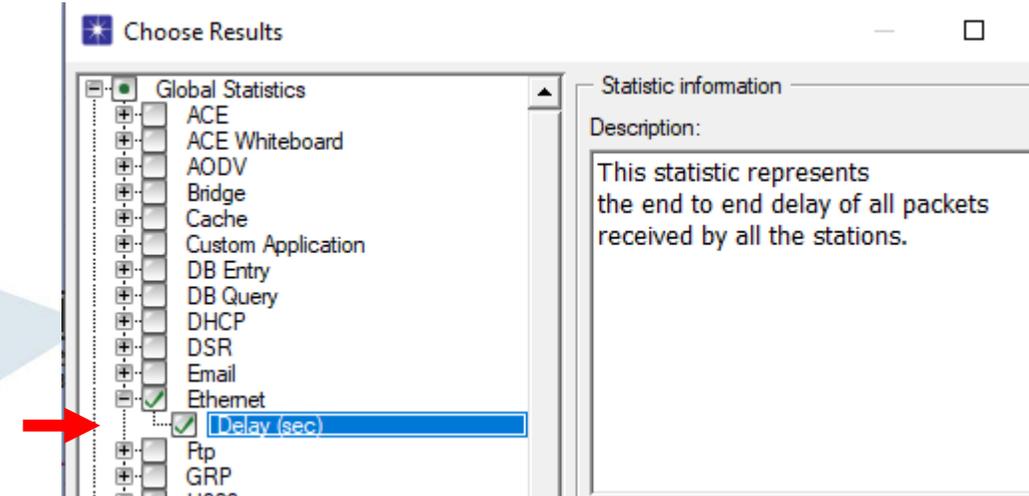
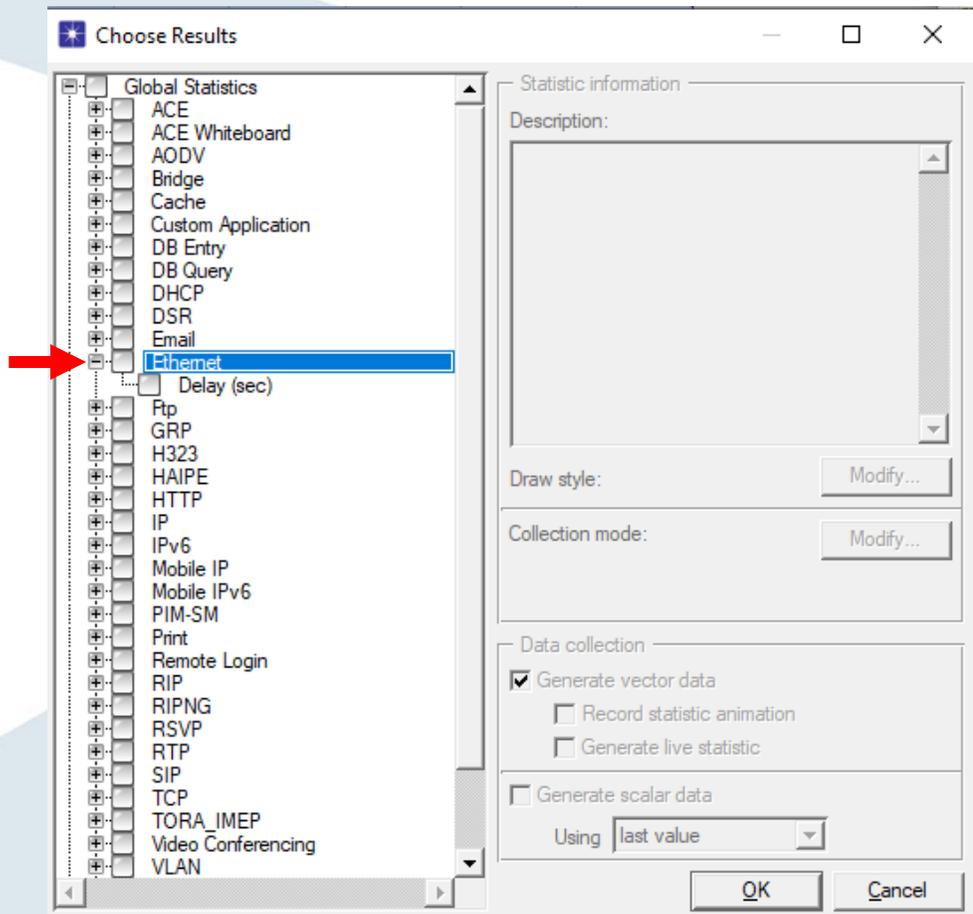


لتحليل أداء الشبكة ننقر بزر الفأرة  
اليميني على أي مكان ضمن سطح  
العمل الأزرق ونختار  
Choose individual DES  
Statistics

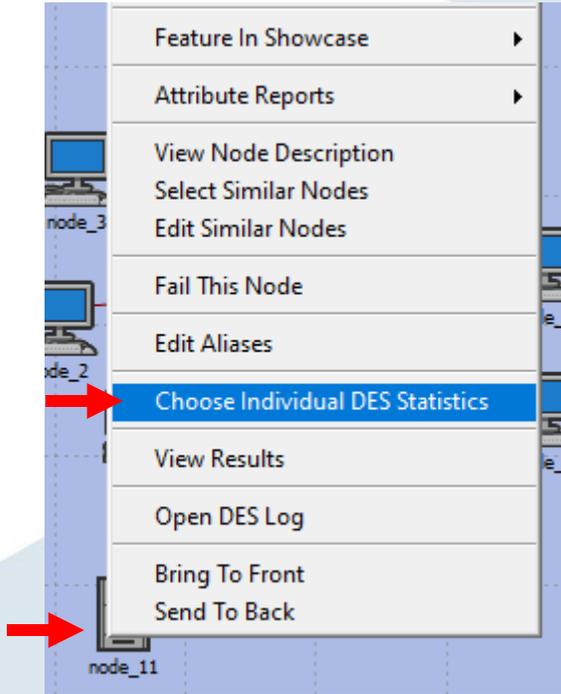


من هنا نختار البيانات التي نريد  
عرضها و تحليلها  
سنقوم بتحليل التأخير ضمن شبكة  
ethernet  
ثم سنقوم بتحليل معدل الحزم  
المستقبل بوحدة bit/sec

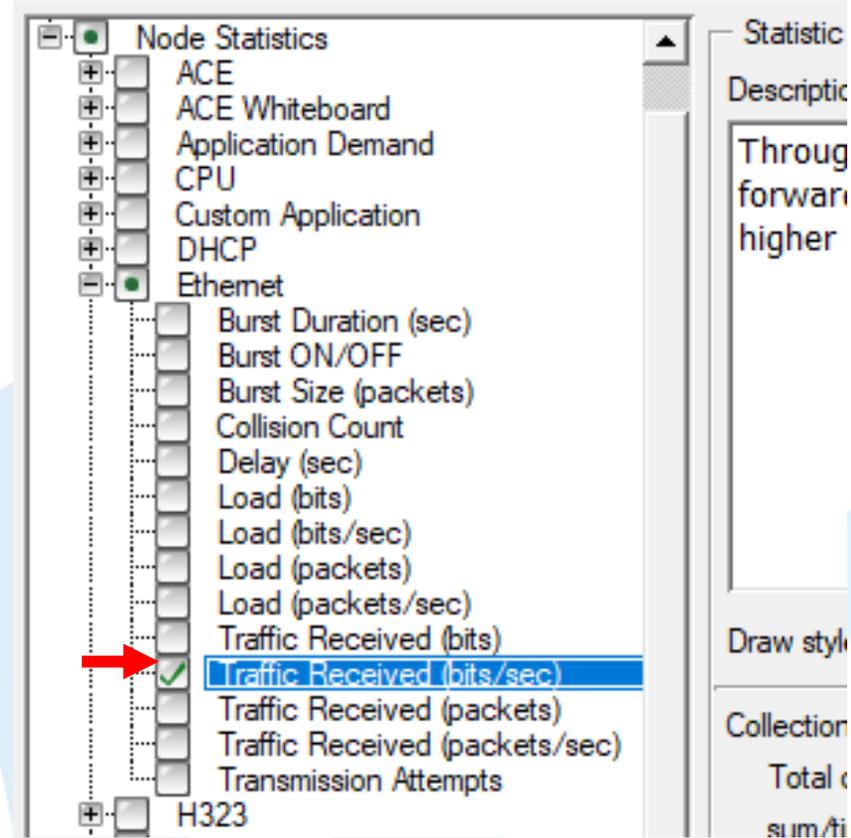




سنقوم بتحليل الحزم المستقبلية على السيرفر وبالتالي نتبع الخطوات السابقة ولكن بعد النقر بالزر اليميني على السيرفر و تحديد تخصيص التحليل



Choose Results: top.Office Network.node\_11



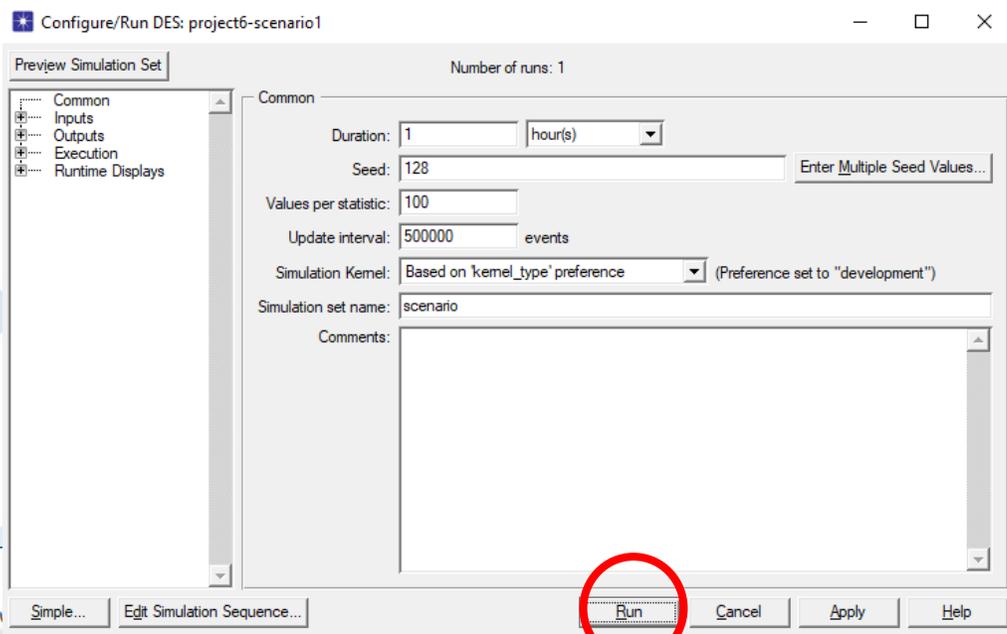
نقوم باستخدام زر run يبدأ  
التجربة كاملة للحصول على  
النتائج

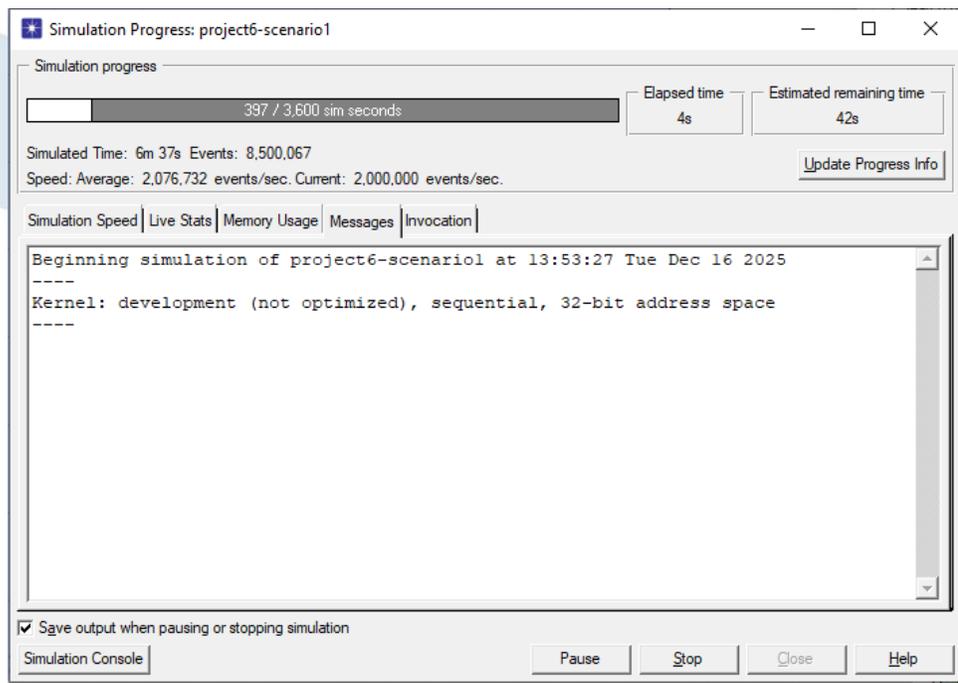
Project: project6 Scenario: scenario1 [Subnet: top.Office Network]

File Edit View Scenarios Topology Traffic Services Protocols NetDoctor New Analysis DES Design Window

Simple... Edit Simulation Sequence... Run Cancel Apply Help

Configure/Run Discrete Event Simulation (DES)





Simulation Progress: project6-scenario1

Simulation progress

397 / 3,600 sim seconds

Elapsed time: 4s Estimated remaining time: 42s

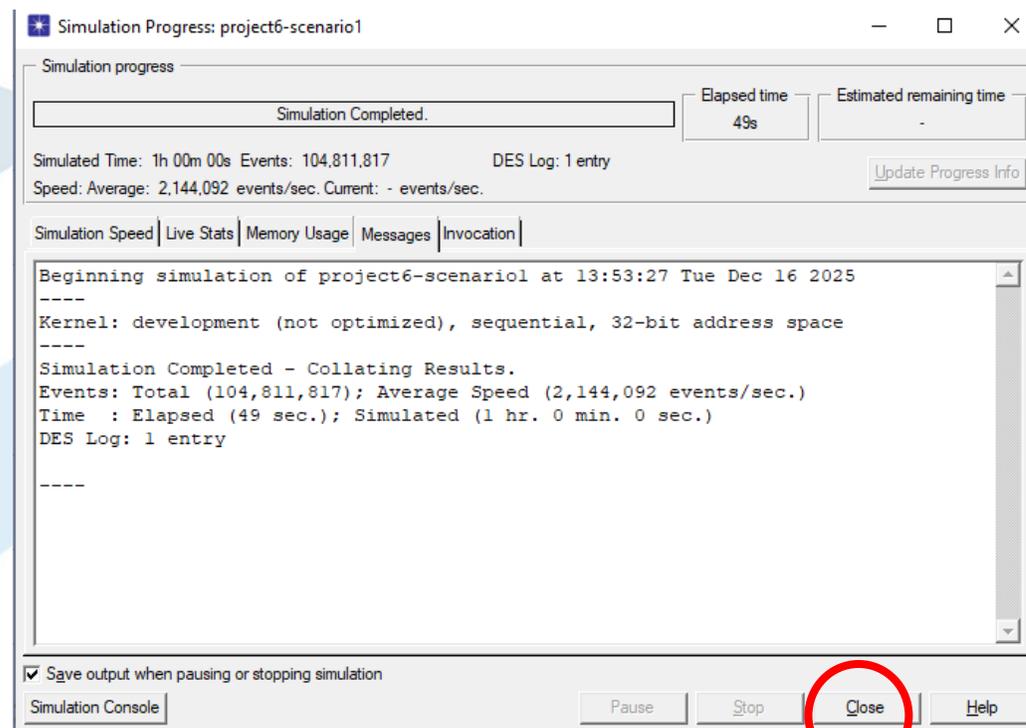
Simulated Time: 6m 37s Events: 8,500,067  
Speed: Average: 2,076,732 events/sec. Current: 2,000,000 events/sec. [Update Progress Info](#)

Simulation Speed | Live Stats | Memory Usage | Messages | Invocation

```
Beginning simulation of project6-scenario1 at 13:53:27 Tue Dec 16 2025
----
Kernel: development (not optimized), sequential, 32-bit address space
----
```

Save output when pausing or stopping simulation

Simulation Console [Pause](#) [Stop](#) [Close](#) [Help](#)



Simulation Progress: project6-scenario1

Simulation progress

Simulation Completed.

Elapsed time: 49s Estimated remaining time: -

Simulated Time: 1h 00m 00s Events: 104,811,817 DES Log: 1 entry  
Speed: Average: 2,144,092 events/sec. Current: - events/sec. [Update Progress Info](#)

Simulation Speed | Live Stats | Memory Usage | Messages | Invocation

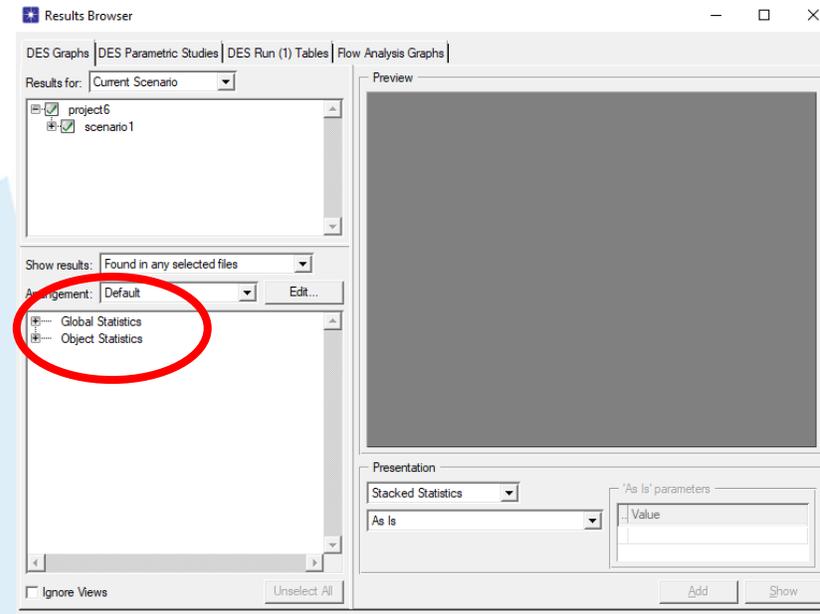
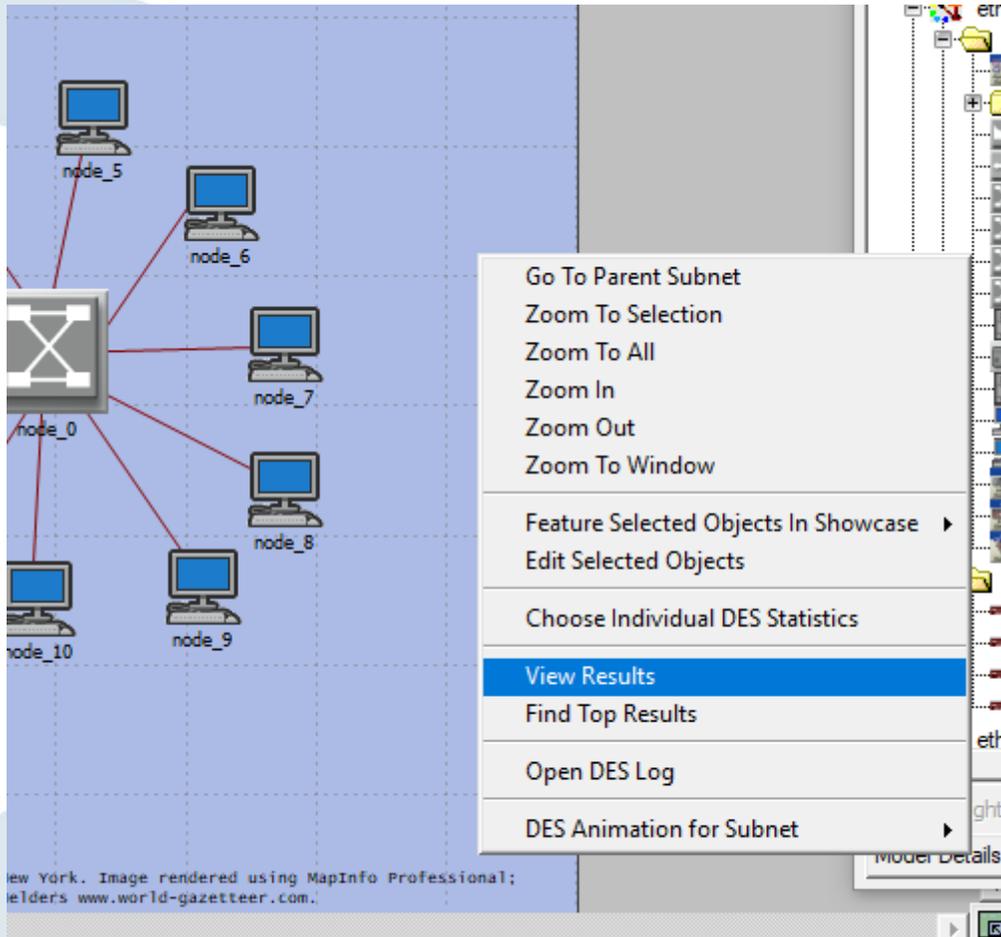
```
Beginning simulation of project6-scenario1 at 13:53:27 Tue Dec 16 2025
----
Kernel: development (not optimized), sequential, 32-bit address space
----
Simulation Completed - Collating Results.
Events: Total (104,811,817); Average Speed (2,144,092 events/sec.)
Time : Elapsed (49 sec.); Simulated (1 hr. 0 min. 0 sec.)
DES Log: 1 entry
----
```

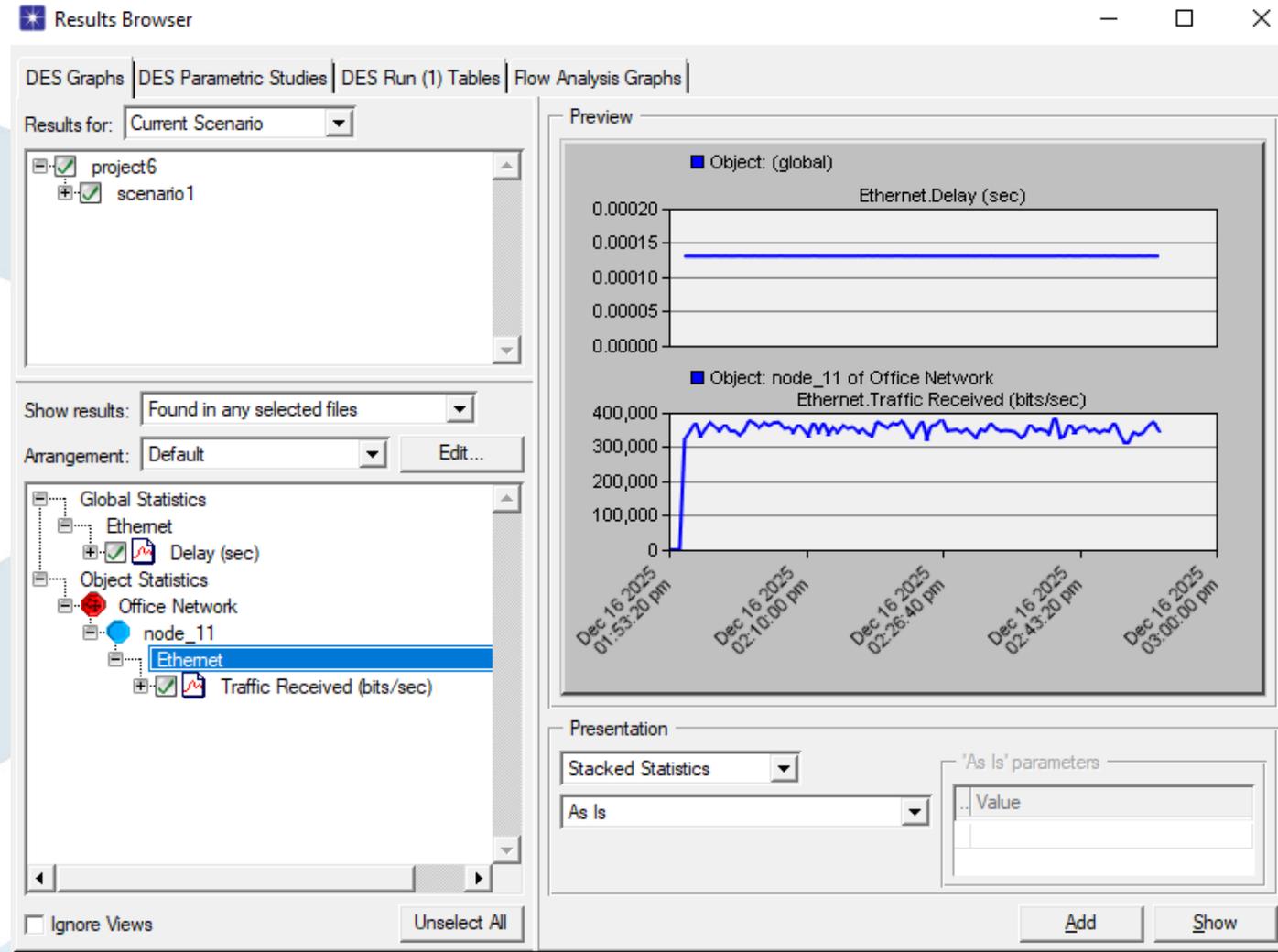
Save output when pausing or stopping simulation

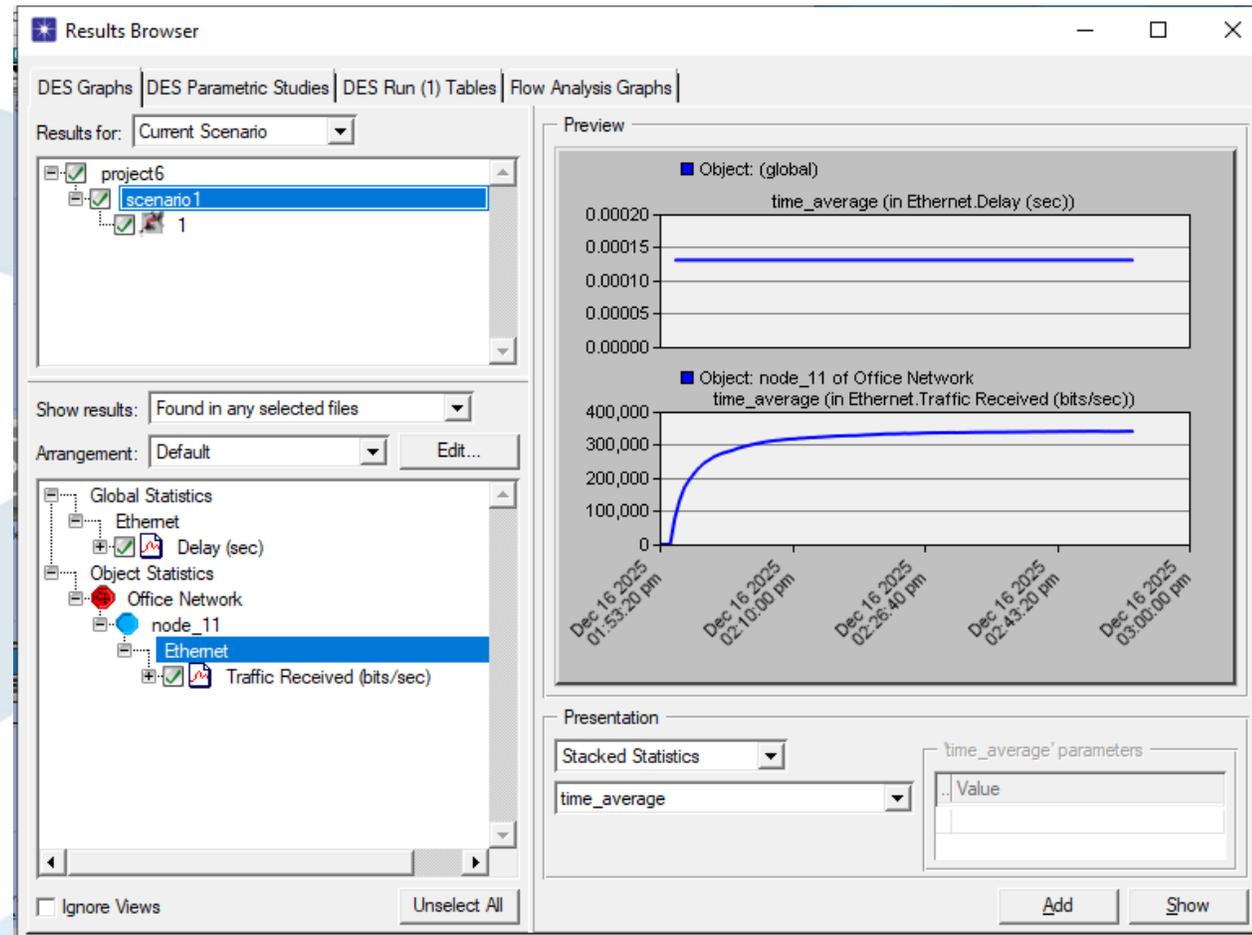
Simulation Console [Pause](#) [Stop](#) [Close](#) [Help](#)



## إظهار النتائج زر يميني على الشاشة الزرقاء ثم view results







# Thanks for Listening

