Icon-5066 Evaluation Guide

Configuring R3.1 release of Isode's Icon-5066 Server on Windows and Linux Platforms for use with applications requiring a single STANAG 5066 node or multiple STANAG 5066 nodes.

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Introduction

This guide is intended to give the reader basic information on how to configure Isode's Icon-5066 Server Product. Icon-5066 is a STANAG 5066 Server that can support multiple STANAG 5066 nodes on a single server.

Supporting multiple nodes on a single server is very helpful in lab environments, which this guide is aimed at. In a live environment it is likely that different nodes will be on different networks and locations, as such in this scenario an Icon-5066 Server will be required for each node.

More information on Icon-5066 can be found at www.isode.com/product/stanag-5066-server/

Objectives

In this guide you will be shown how to configure three STANAG 5066 nodes that are connected to Isode's Modem Radio Sky Simulator (MoRaSky) in a Wireless Token Ring configuration. It should be noted that this is not designed to configure Icon-5066 for your requirements but merely give you experience of configuring Nodes and Devices.

The diagram below gives an overview of this setup.

System Overview



By the end of this guide you will have:

- 1. Installed the Icon-5066 server software and started the Icon-5066 Services
- 2. Used the web based user interface to configure S5066 Node 1, S5066 Node 2 and S5066 Node 3 that are connected to each other via a local Isode MoRaSky instance.
- 3. Connected the S5066 Console GUI to S5066 Node 1, S5066 Node 2 and S5066 Node 3 to test data throughput and chat.

For the purposes of this evaluation we have assumed this is a "clean" installation of Icon-5066 on to a physical or virtual machine. If you have previously installed Icon-5066 on the hardware or VM you are using for this evaluation, please make sure you have completely uninstalled that version before proceeding.



Using Isode Support

You will be given access to Isode support resources when carrying out your evaluation. Any queries you have during your evaluation should be sent to *isode.support@isode.com*. Please note that access to the Self-Service Portal for web-based ticket submission and tracking is not available to evaluators.

Preparing the Server Environment

You should visit *https://www.isode.com/support/platform-support/* to discover which operating systems are supported for Isode evaluations.

Naming the Server

Make the machine name : ICON5066SERVER Make the primary dns suffix for the server HEADQUARTERS.NET Alternatively, you may use your own names or add dns entries in a dns server or hosts file.

Install the Isode Software

Follow the instructions in the release notes for the appropriate platform for the products. For this guide, the following products were used:

Icon-5066 3.1v3 M-Switch 19.0v21 MAS 1.1 (Optional, see Product Activation later in this document)

On Windows, select the default install options when executing the installer for Icon-5066 and MAS.

Remember to install an appropriate java runtime engine (refer to product release notes) and in a Windows environment the visual c++ redistributable package.

Start the M-Switch installer and, when asked for a Setup Type, choose [Custom]

Custom	M-Switch	Instal	lation
--------	----------	--------	--------

謂 Isode	M-Switch 19.0 Setup —		×
Choo	se Setup Type		
Cho	ose the setup type that best suits your needs		
	Typical An installation which contains only the M-Switch components requi Internet and X.400 messaging. Custom	ired for	
	Allows users to choose which program features will be installed an they will be installed. Recommended for advanced users.	d where	
	Complete		
	All program features will be installed. Requires the most disk space	2.	
	Back Next	Canc	el

In the **Custom Setup** screen disable all of the features except for "Messaging Graphical Tools" and "Messaging Management Tools" by selecting, for every other option, the "Entire Feature will be unavailable" option.

Custom Setup				
🖟 Isode M-Switch 19.	0 Setup	-		×
Custom Setup Select the way you	want features to be installed.		1	-
Click the icons in th	e tree below to change the wa ftware M-Switch Audit Datat Will be installed on loc: Entire feature will be in SOM Development SOM Development >	This component cont Audit Database Servi al hard drive stalled on local hard dri navailable	ins M-Switch ces ive uu Browse.	r
Reset	Disk Usage	Back Next	Canc	el

Click "Next" on this screen and "Install" on the next. On the "Completed" screen click "Finish". On Linux, install all the RPMs with the command:

sudo rpm -i ISD*.rpm

Please use a supported web browser as documented in the product release notes.

Activating the Isode Products

Isode Products are typically Activated using the Isode Messaging Activation Server (MAS). Some Isode Products, such as Icon-5066 also support local Product Activation. If you are installing other Isode Products such as M-Switch, M-Vault, M-Box etc on the same server as Icon-5066 we recommend using MAS and you should refer to the MAS Evaluation Guide for how to do that. For this Guide we will use the Local Product Activation in Icon-5066. You will need to start Icon-5066 first. For Windows this is done using the Isode Services Configuration Tool.

Isode Service Configuration – Icon-5066

Service Configuration		_		×
Service Configuration Operations View	v Help			
Isode Services				
🕂 Add 🗋 Refresh All 💈 Refresh	🕨 Start 🌗 Start Tree 🔞 Stop 🗙 Remove			
🛟 Icon-5066 Distributed Data Se	General Recovery Advanced			
	Service Name Icon-5066 Distributed Data Service			^
	Service Status Stopped			
	Start Type Automatic 🗸			
	Product Activation Status			
	< Activation file (C:\lsode\etc\activate.dat) not found >			
				~
< >		Apply	Can	cel
Abort				

Start the Service

On Linux use the command line below.

sudo systemctl start isode.icon.ddsd

To Activate Icon-5066 point your browser to the URL below.

http://icon5066server:4001

Icon-5066 Product Activation Step 1

✓ S Icon-5066 Console × +	- 0 X
← → C ▲ Not secure icon5066server:4001	☆ 💄 :
Icon-5066 Product Activation	
Icon-5066 is not activated.	
If Isode has sent you an Activation Key, you may enter it now.If not, or you require different features, please request one.	
Request Activation Key Enter Activation Key	

Click Request Activation Key.

Icon-5066 Product Activation Step 2

Product Activation	×
Please provide a reference identifying this Icon-5066 server, which will be disp of the product activation information.	layed as part
Reference:	
Icon-5066 Evaluation	
Generate Activation Request	Back

Enter a "Reference" and Click "Generate Activation Request".

×

Back

Icon-5066 Product Activation Step 3

Product Activation

Please send the following Activation Request code to the Isode Product Activation Service <u>support@isode.com</u>, explaining your requirements for this server.

ZmVhdHVyZT0iSWNvbi01MDY2IiBjdXN0b21lci1yZWY9Ikljb24tNTA2NiBFdmFsdWF0aW9uIiBob3N 0aWQ9IlVVSUQ7MjU0NWVmOTgxMDM4ZmVmY2U4YzlhMzNjMDg1MWY2YjMyMTFlZmM2NmY1YTkwODViYW M4NTgwMDAyZjdlNzg2MzBiYTgzYTc4MmI0MzdiZDc2MGI4ZDVjNDBjMGE2ZmQ4NTBkNTdmZjExMjM0Y zUzMTc10WYwMGJiNjNmYmZkZDci

Ð

μ.

Copy the Activation Request using the icon on the bottom left corner and send it to isode.support@isode.com noting that this is for an Icon-5066 Evaluation. Isode Support will then send a Product Activation Key. When they have done this click the "Back" button.

Icon-5066 Product Activation Step 4

Icon-5066 Product Activation

Icon-5066 is not activated.

- If Isode has sent you an Activation Key, you may enter it now.
- If not, or you require different features, please request one.

|--|

Click "Enter Activation Key"

×

Icon-5066 Product Activation Step 5

Product Activation

Please input the Activation Key provided by the Isode Product Activation Service for Icon-5066.

Jlcj0iSW50liBjdXN0b21lci1yZWY9lkV2YWwgR3VpZGVzIHV wZGF0ZSIgY3VzdG9tZXItbmFtZT0iSXNvZGUgLSBNYXJrIgp zaWduPSJNRVIDSVFEcktucnhuMldKY1cwNzIEMjZiZDY1blp OZTRhenI2YUg5NkhYU3FXNEJ4QUloQUx6VkZoSmhvY2t WRUdCeWpIQ05kSjFyN043cmI0SExYWndwY3Z5TVQzcEoi Cg==	•	
	//	

Paste in the Activation Key Sent by Isode Support and Click the "Activate" button. If there are no errors you will be presented with the Icon-5066 Initial Configuration Screen.

V S Icon-5066 Console	· +	-	٥	×
← → C ▲ Not secure icon5	066server:4001	☆		:
🔂 Icon-5066	Dashboard Import Node	Logs	(2) Abou	it
Dashboard				
Managed Modems	(+)			
₽ TLS				
🔒 X.509				
🕏 OAuth				
🕏 ALE				

Icon-5066 Product Activation Step 6

Adding & Configuring Nodes

The Icon-5066 Server can support multiple S5066 Nodes (on separate ports) on a single server. These nodes are configured using the **Icon-5066 Console**, a Web-based management tool. In this section we're going to add 3 Nodes.

In this guide we're going to configure nodes to use Isode's MoRaSky (Modem Radio Sky), a software tool provided by Isode to help test Isode HF products. MoRaSky provides a service equivalent to HF modems connected to Radios and operating over the Ionosphere. It enables sophisticated testing of Icon-5066 and the applications it supports, without use of hardware or over the air transmission.

If your intention is to use physical modems in place of MoRaSky, please consult Icon-5066 Administration Guide in conjunction with this section.

Launch the Icon-5066 console by launching a web browser and entering *http://myserver.hostname:4001*

Empty Icon-5066 dash	board			
✓ ③ Icon-5066 Console	× +		-	ø ×
← → C ▲ Not secure icon	066server:4001		☆	😩 :
💼 lcon-5066	Dashboard	Import Node	Logs	(? About
📰 Dashboard				
Managed Modems	(\pm)			
👂 TLS				
🖴 X.509				
OAuth				
🕏 ALE				

Adding Node 1

Click the "+" Button.

In the "Add Node" dialogue, enter the following information :

- Enter a Friendly Name for Name, we will use "Node 1 MoRaSky 1"
- Enter the **Node Address** (typically 10.50.66.0 for the first node). Node addresses must be unique and are similar to IPv4 syntax, but the first octet has max value of 15. The choice for demos is arbitrary, but live deployments have rules for international allocation.
- Enter the **SIS Host** (the hostname of your Icon-5066 Server), this is optional and if left blank Icon-5066 will listen on all IP Addresses. If your server has multiple IP Addresses and you want each node to listen on a specific IP Address then you should enter the IP Address or hostname here.
- Enter the **SIS Port**, 5066 is the standard port for this protocol but if you are configuring multiple nodes on the same server you will need different Ports for each node.
- The remaining fields can be left with their default values.

Configure Node inform	ation				
✓ S Icon-5066 Console	x +		-	٥	×
← → C ▲ Not secure	icon5066server:4001/configuration/?add=true	Q	☆	-	: Vou
🔂 Icon-5066	Add Node	Import Node		Logs /	Bout
Dashboard Managed Modems	() node options				Â
TLS	General Link Advanced				
A X.509	A name for easier identification of the Node by operators Node 1 MoRaSky - 1				
🕏 OAuth	Node Address Required The 5066 Address of the Node				
	10.50.66.0				
	SIS Host The host name or IP address of the server				
	SIS Port Required TCP port number for a SIS connection 5066				

Then Scroll to the bottom

dd New Node		
	TLS on SIS streams Enable TLS on SIS connections	
	O Disable O Enable	Vse default
	Add	Cancel

and Click "Add". You should get a notification that the Node was successfully added. Then Click on "Dashboard.

Dashboard



Configuring Node 1

Each node consists of a core configuration together with a number of devices that are used by, or control the behaviour of, the S5066 node. Each working node configuration must define the following set of mandatory devices.

- **Modem** device that defines how to communicate with the underlying modem (simulated or real).
- **Rate Change** device controls the rate at which data can be sent to the modem.
- Transmission Control device controls the pattern of data transmission.

From the dashboard, select "Devices" for the Node you have just created.

In this evaluation we will be using the MoRaSky GUI to create a clear channel, 3 Radio configuration using Waveform 5069, Bandwidth 24, 38400 bps and small Interleaver.

Add first device

· ·) · · · · · ·					
Con-5066 Console	× +		-	٥	×
\leftarrow \rightarrow C \triangle Not secure	icon5066server:4001/configuration/10.50.66.0/devices	Q	☆	2	:
💼 Icon-5066	Devices Dashboard > Devices (10.50.66.0)		L	5 185 /	e Noout
Dashboard					
Managed Modems	(+)				
👂 TLS					
🖨 X.509					
🕏 OAuth					
Ø ALE					

Click the "+" button.

Choose	а	new	device

Choose	new	device:

ALE Device	
EOT Engine	
Modem	
Monitoring	
Rate Change	
RX-end Handler	
Receive Modem	
Transmission Control	
Transmit Modem	
Next	Cancel

Select "Modem" and Click "Next...".

Choose Device Driver

codan	
data_only	
leonardo	
loop	
morasky	
rapidm	
thales	

Select the "morasky" mode	m and click "Select".	
Configure Modem ip address	Add Device	
🔠 Dashboard	① Morasky modem simulator driver	
Managed Modems		Required
👂 TLS	IP address RAP1 interface IP address. More	
🔒 X.509	127.0.0.1	
🥏 OAuth	Port number RAP1 interface port number	
🥏 ALE	58001	✓ Use default
	Streaming configuration 'clock' is fine for half-duplex communication, but risks und More clock	✓ Use default
	Serial driver configuration If not specified, then the driver will send and receive data More	

Enter 127.0.0.1 for the IP Address, all other values are default, and scroll to the bottom.

Driver respawning configuration	
In the event that a driver fails it may be restarted (respaw More	
delay=2 max_mem=10000 max_cb=1000	✓ Use default
Add	Cancel
Add	Cancer

Click "Add", you will get a Notification that the device has been added. Then from the top menu.

Select Devices				
न Icon-5066	Modem (morasky)	Delete device	Logs	About
	Dashboard > Devices (10.50.66.0) > Modem (morasky)			

Click "Devices".

Modem device added	Devices Dashboard > Devices (10.50.66.0)		Logs About
Dashboard	Modem morasky		
Managed Modems			
👂 TLS	Device configuration looks valid	(+)	
▲ X.509	14% 1 of 7 parameters using custom values	Ŭ	
Ø OAuth	Configure		
🕏 ALE			

Click the "+" Button.

Select	rate	chanae	device
JUICEL	ruic	chunge	ucvicc

ALE Device	
EOT Engine	
Monitoring	
Rate Change	
RX-end Handler	
Receive Modem	
Transmission Control	
Transmit Modem	
Next	Cancel

Select "Rate Change" and Click "Next...".

Select fixed driver

Choose new device d	lriver:
fer	
fixed	
snr	
Select	Back

Select "fixed" and Click "Select".

Select a waveform	_			
	Add Device		Ē	e
ICON-5000	Dashboard > Devices (10.50.66.0) > Add Device		Logs A	bout
Dashboard				^
	③ Fixed waveform and parameters			- 1
Managed Modems				- 1
👂 TLS	Waveform Waveform to configure in modem	 Required		
A X 509	Please select an option	\$		- 1
	wf=5069 bw=24 bps=38400 ilv=US	1		- 1
🕏 OAuth	wf=5069 bw=24 bps=38400 ilv=S			- 1
	wf=5069 bw=24 bps=38400 ilv=M			
🕏 ALE	wf=5069 bw=24 bps=38400 ilv=L	Use default		
	wf=5069 bw=24 bps=51200 ilv=US			
	wf=5069 bw=24 bps=51200 ilv=S			
	wf=5069 bw=24 bps=51200 ilv=M			
	wf=5069 bw=24 bps=51200 ilv=L			
	wf=5069 bw=24 bps=64000 ilv=US	Vse default		
	wf=5069 bw=24 bps=64000 ilv=5			
	wf=5069 bw=24 bps=64000 ilv=M			
	wf=5069 bw=24 bps=64000 ilv=L			
	wf=5069 bw=24 bps=76800 ilv=US	Use default		
	wf=5069 bw=24 bps=76800 ilv=5			
	wf=5069 bw=24 bps=76800 ilv=M			
	wf=5069 bw=24 bps=76800 ilv=L			
	wf=5069 bw=24 bps=96000 ilv=US			

From the "Waveform" drop-down select wf=5069 bw=24 bps=38400 ilv=S". All other values are default. Then scroll to the bottom.

Driver respawning configuration	
In the event that a driver fails it may be restarted (respaw More	
delay=2 max_mem=10000 max_cb=1000	✓ Use default
Add	Cancel

Click "Add", you will get a Notification that the device has been added. Then from the top menu.



Click "Devices".

Rate change device ada	led		
	Devices		B 🤌
CON-5066	Dashboard > Devices (10.50.66.0)		Logs About
Dashboard			
	Modem morasky	Rate Change fixed	
Managed Modems			
👂 TLS	Device configuration looks valid	Device configuration looks valid	
	14% 1 of 7 parameters using custom values	7% 1 of 15 parameters using custom values	
🔒 X.509			
🕏 OAuth	Configure	Configure	
🕏 ALE			
	(+)		

Click the "+" Button.

Select the	transmission	control	device	

Choose new device:	
ALE Device	
EOT Engine	
Monitoring	
RX-end Handler	
Receive Modem	
Transmission Control	
Transmit Modem	
Next	Cancel

Select "Transmission Control" and Click "Next...".

Select wtrp transmission control

Choose new device driver:	
ale_121	
bc_cont	
bc_gaps	
csma	
notx	
si_cont	
si_gaps	
wtrp	
Select	Back

Select "wtrp" and Click "Select".

Configure and add WTRP

	Add Device		Đ	e
Con-Sugo	Dashboard > Devices (10.50.66.0) > Add Device		Logs	About
Dashboard	() WIRP			
Managed Modems				
👂 TLS	Seconds to wait for modem to drop RX-active after EOT This is for recovery from unexpected modem behaviour, o More			
🔒 X.509	10	🗹 Use default		
🥏 OAuth	Seconds to wait before aborting transmission (both Rx and This is for recovery from unexpected modem behaviour	Tx)		
🕏 ALE	150	Vse default		
	Add	Cancel		

Leave the default values and Click "Add", you will get a Notification that the device has been added. Then from the top menu.

Select Devices				
	Transmission Control (wtrp)	Delete device	Ei.	4
	Dashboard Devices (10.50.66.0) Transmission Control (wtrp)	Delete device	Logs	About

Transmission control device added Devices About Logs 💼 Icon-5066 Dashboard > Devices (10.50.66.0) Dashboard Modem morasky E. Rate Change fixed E Managed Modems Device configuration looks valid Device configuration looks valid 👂 TLS 14% 1 of 7 parameters using custom values 7% 1 of 15 parameters using custom values 🔒 X.509 Configure Configure 🥏 OAuth 🥏 ALE Transmission Control wtrp Device configuration looks valid • ٠ 0% No parameters using custom values Configure

You have now completed configuration of Node 1.

Adding & Configuring Node 2 and 3

From the "Dashboard".

Deckhard

Dashboara		
✓ S Icon-5066 Console	× +	– 0 ×
$\leftarrow \rightarrow \ C \ \triangle$ Not secure	icon5066server:4001	९ 🕁 😩 :
🖬 Icon-5066	Dashboard	Import Node
Dashboard	Node 1 MoRa 10.50 (2)	
Managed Modems		
₽ TLS	Stopped Inactive	
🖴 X.509	0	
S OAuth	Node Devices Monitor Controls	
🕏 ALE		

Use the "+" Button to Add and configure Node 2 and 3 in the same way as Node 1 but using the following parameters:

- Node 2 Name : Node 2 MoRaSky 2
- Node 2 Address: 10.50.66.1
- Node 2 Port: 6066
- Node 2 MoRaSky Port: 58002
- Node 3 Name : Node 3 MoRaSky 3
- Node 3 Address: 10.50.66.2
- Node 3 Port: 7066
- Node 3 MoRaSky Port: 58003

At the end of this process, Icon-5066 Console Dashboard should display 3 Nodes as below :



Enabling the Nodes

Nodes to be enabled			
Con-5066 Console	× +		– 0 ×
$\leftarrow \rightarrow C \land Not secure$	icon5066server:4001		९ 🖈 😩 🗄
🔂 Icon-5066	Dashboard		Customise and control Google Chrome
Dashboard	Node 1 MoRa 10.50 (22)	Node 1 MoRa 10.50 22	
TLS	Stopped	Stopped	
🔒 X.509	U		
🕏 OAuth	Node Devices Monitor Controls	Node Devices Monitor Controls	
🕏 ALE	Node 1 MoRa 10.50 (22)		
	Stopped Inactive	(+)	
	Node Devices Monitor O Controls		

Select "Dashboard". Each node should be displayed on the dashboard:

Press the "Controls" button in the "Node 1 MoRaSky – 1" pane and on the dropdown, select "Enable"

Enable a node	Dashboard		Import Node	E P
Dashboard	Node 1 MoRa 10.50 (Zz)	Node 1 MoRa 10.50 (Zz)		
Managed Modems				
👂 TLS	Stopped	Stopped		
🔒 X.509				
🕏 OAuth	Node Devices Monitor Cor	Node Devices Monitor O Controls		
🕏 ALE	Node 1 MoRa 10.50 Zz Start			
	Rest	art		
	Inactive Enab			
	Disa	ble		
	Node Devices Monitor Cor	0 Introls		

Repeat for nodes 2 and 3.

A green tick should now indicate each node has been enabled:



Configuring and Starting MoRaSky

On Windows open the MoRaSky GUI from the Windows Start menu





On Linux start the MoRaSky GUI by :

/opt/isode/sbin/moraskyGUI

Press "Create Profile ...", provide a profile name and description and press "OK".

Creating a MoRaSky profile

Name Descript	ion Run Comm	
	💽 Create Profile - 🗆 X	Create Profile
	Create a new profile, containing a set of MoRaSky options.	Edit Profile
		Duplicate Profile
	Name: Icon-5066 Evaluation	Delete Profile
	Description 3 Nodes Clear Signal	Export Arguments
	RC File	Copy Arguments
	OK Cancel	Save Profiles

Select "Radio" tab :

📧 MoRaSky - Icon-5066 E	valuation			-	×
File					
Profiles Radio Errors I	Modem System MoRaSky I	excution			
Configured Pr	ofiles				
Configured Pro	ofiles				
Configured Pro	Description	Run Command (RC) File			
Configured Pro Name Icon-5066 Evaluation	Description 3 Nodes Clear Signal	Run Command (RC) File			
Configured Pro Name Icon-5066 Evaluation	Description 3 Nodes Clear Signal	Run Command (RC) File			

Increase the number of radios to "3", change the waveform to "WF_5069", set the bandwidth to 24, the speed to "38400", the Interleaver to "S" and press "Save".

Configure radio parameters		_	П	×
File				~
Profiles Radio* Errors Modem System MoF	aSky Execution			
Radio Type Port Radio 🔹 Nu Ba	nber of radios* 3 ×			
Waveform* WF_5069 - Bandwidth 24	▼ Speed 38400 ▼ Interleaver S			
Miscellaneous				
Enable Radio locations	Edit Radio Locations			
EMCON				
Pair Radio frequencies				
Duplex Radios in pairs				
Duplex Radios in triples				
Bypass modem/radio simulation				
Transmit Async Serial Framing				
Enable pairs for split-site emulation	Edit Radio Pairs			
Enforce half-duplex in split-site mode				
			_	
		Reve	ert	Save

Acknowledge the "Profiles Saved" information dialogue.

Select the MoRaSky Execution Tab

Location of MoRaSky Execution Tab		
I MoRaSky - Icon-5066 Evaluation	_	×
File		
Profiles Radio Errors Modem System MoRaSky Execution		
Radio Type Port Radio 👻 Number of radios 3 🍝		

Press "Start" and note MoRaSky listening on ports 58000 - 58003.

Ma III	DRaSkyExecution MoRaSky - Icon-5066 Evaluat	ion	_	×
Fil	e			
Pro	files Radio Errors Moder	m System MoRaSky Execution		
	=== 1CON-5066 EVALUA	tion: Starting MokaSky at 0/-Jan-2025 10:49:3/ ===		^
	Running with:-bp 580	01 -wf wf=5069 bw=24 bps=38400 ilv=S -P 3 0.0.0.0		
	SERIAL HUB	listening on 0.0.0.0 port 58000 (ISTPRO)		
	London	listening on 0.0.0.0 port 58001 (RAP1/RIPC or MIL-STD-188-110 App-A 5.1)		
	Washington	listening on 0.0.0.0 port 58002 (RAP1/RIPC or MIL-STD-188-110 App-A 5.1)		
	Berlin	listening on 0.0.0.0 port 58003 (RAP1/RIFC or MIL-STD-188-110 App-A 5.1)		
	Bit-error source:	none		
	Interference source	: none		
	Crypto box:	none		
	Initial waveform:	wf=5069 bw=24 bps=38400 ilv=S eom=1 (510ms block)		
	Radio frequencies:			
	Radio 1 (dev=0) tx=	1500000 rx=1500000		
	Radio 2 (dev=1) tx=	1500000 rx=1500000		
	Radio 3 (dev=2) tx=	1500000 rx=1500000		
	0000.086 [PortSessio	n /127.0.0.1:50732 on 0.0.0.0:58003] Session start		
	0000.379 [PortSessio	n /127.0.0.1:50733 on 0.0.0.0:58002] Session start		
	0001.553 [PortSessio	n /127.0.0.1:50734 on 0.0.0.0:58001] Session start		
				\sim
	Start Stop Clear			
			Kever	Save

You will also note that the nodes have automatically connected to MoRaSky.

In the Icon-5066 Console, select "Dashboard" and all three nodes should appear.

Icon-5066 Status			
듐 Icon-5066	Dashboard		Import Node
Dashboard	Node 1 MoRa 10.50 (Zz) 文 🗄	Node 1 MoRa 10.50 (zz) 👽 🕴	
Managed Modems			
👂 TLS	Idle Listening Idle for 0 ms	Idle Listening Idle for 0 ms	
🔒 X.509			
🕏 OAuth	Node Devices Monitor O Controls	Node Devices Monitor O Controls	
🕏 ALE	Node 1 MoRa 10.50 📧 📀 🗄		
	0% Transmitting 0 ms of 510 ms remaining Node Devices Monitor Occumb	(\div)	
	Controis		

The nodes will start transmitting and receiving to create the "Token Ring"

Press "Monitor" under "Node 1 MoRaSky" to see a description of the node status including the current state of the "Wireless Token Ring".

lcon-5066	Dashboard > Node 1	MoRaSky - 1 (10.50	.66.0)			Configure node Logs Ab
Dashboard	Current stat	us		Rx		Wireless Token Ring Monitoring (MON)
Managed Modems					_	
TLS	Modem	Speed n/a	interleaver n/a	Waveform n/a	~	Local node waiting for right to transmit Last timeout: TSLW (07/01/2025, 10:59:40)
(.509	ALE Not connected	Bandwidth n/a	Setup time n/a	Attempts n/a		10.50.66.0 local node
DAuth	Radio	Frequency n/a	Power -11 dBm	PA type n/a	~	
ALE	Device health	Recent activity	/ (10s)			("A") Token ring
	 /modem /ratechg 	Volume n/a	Utilization n/a			10.50.66.2
		Good data	Bad data	40%		
				Error rate		Legend:
	0% Receiv	ing		0 ms of 1 s remain	ing	 Token transfer pending
	Previous rec	eive (Rx)			Prev	/ious transmit (Tx)
	Speed 38400 bps	1	Interleaver short	~	Speed 38400	d Interleaver V D bps short V
	Volume	I	Utilization	~		

It may take a short amount of time for the "Wireless Token Ring" to appear exactly as in the above image.

Testing the Configuration with the S5066 Console

To test that the three nodes connect, we're going to use the S5066 Console, which is installed as during the installation of Isode's M-Switch at the start of this document.

Start the S5066 Console

Start the S5066 Console on Windows by selecting it from the menu



To start S5066 Console on Linux, run the command:

/opt/isode/bin/s5066console

Configure the S5066 Console

From the main S5066 Console screen select "Server > New".

Add new Server



In the New S5066 Server screen enter the following details:

- Friendly Name: Icon 5066 Node 1
- Hostname: localhost
- Port: 5066

Tick the "Auto-discover" Checkbox and then click [OK].

Configuring Node 1 in S5066 Console

New S5066 Server	×
Friendly name: Hostname:	Icon 5066 Node 1 Iocalhost
Port: Broadcast address:	31 2 55 2 55 2 55 2
Auto-discover:	
Throughput test PDU size:	500
Bind timeout (milliseconds):	1000
Rank:	0
Transmission mode:	ARQ Ignore ARQ Broadcast
Data delivery confirmation:	Node confirmation No confirmation Node confirmation Client confirmation
Delivery order:	As they arrive In order As they arrive
Extended field:	Not extended Extended Not extended
Number of retries:	0
OK Cancel	

Now repeat this New Server process for Node 2 and 3, using the details that follow:

- Friendly Name: Icon 5066 Node 2
- Hostname: localhost
- Port: 6066
- Friendly Name: Icon 5066 Node 3
- Hostname: localhost
- Port: 7066

The three nodes will now appear as separate tabs in the S5066 Console.

Nodes in S50 S5066 Console	966 Console			_		>
e Server View	~					
n 5066 Node 1 >	< Icon 5066 Node 2	Icon 5066 Node 3				
eers Throughp	out Chats Trace					
Name	Address					
Discover Add	d Remove					
Connected to	localhost:5066				Con	nec

Testing with the S5066 Console

Clicking "**Discover**" on the Node 1 tab will allow you to see Icon 5066 Node 2 and Icon 5066 Node 3 on the Icon 5066 Node 1 tab and Icon5066 Node 1 on the Node 2 and Node 3 tabs.

	\times
Server View	
n 5066 Node 1 × Icon 5066 Node 2 Icon 5066 Node 3	
Throughput Chats Trace	
Name Address	
Icon 5066 Node 2 10.50.66.1	
Icon 5066 Node 3 10.50.66.2	
	_
Discover Add Remove	
Connected to localhost:5066 Con	nect

Changing to Icon 5066 Node 3 tab and clicking "Discover" will result in the "Icon5066 Node 3" tab showing "Icon 5066 Node 2" and the remaining two tabs showing "Icon 5066 Node3". Now each node in the S5066 Console has the ability to communicate with the other two nodes.

You may like to show that the connectivity exists by running a throughput test. Select a node (in image – Icon 5066 Node 1), select the "Throughput" sub tab, pick a "receiving peer" in the dropdown and click "Start". The GUI reports pertinent link statistics.

Throughput test	t							
S5066 Console						-		\times
File Server View								
Icon 5066 Node 1 × Id	con 5066 Node 2 📄 Icon 5066	Node 3	<u> </u>					
Peers Throughput C	hats Trace							
Sending Receiving								
Start Stop								
Configuration:								
Receiving peer:	lcon 5066 Node 2 (10.50.66.1)	\sim	Transmission mode:		Non-ARQ			\sim
Packet size (bytes):	2048	-	Packet rate (per secon	d):	0			×
Report:								
Packets sent:	364	Test du	ration (seconds):	7				- 11
Flow control:	On	Flow co	ontrolled (seconds):	6				-
Tx (bits):	5963776	Tx (byte	es):	74	5472			- 11
Tx rate (bits/second):	851968	Tx rate	(bytes/second):	10	6496			- 11
Ack'ed (bits):	0	Ack'ed	(bytes):	0				-
Link utilization:	-	_at nom	inal rate (bits/second):	no	one			~
Connected to localh	ost:5066						Con	nect

You may also like to use the operator chat functionality to message between nodes.

S5066 Console	-	- 🗆	>
e Server View			
n 5066 Node 1 × Icon 5066 Node 2 Icon 5066 Node 3			
eers Throughput Chats Trace			
con 5066 Node 2 Icon 5066 Node 3			
			~
ay: Hello Node 2	Send Mod	e: ARQ	
ay: Hello Node 2	Send Mod	e: ARQ	
ay: Hello Node 2	Send Mod	e: ARQ	
ay: Hello Node 2	Send Mod	e: ARQ	

Type your message in the "say" box and press "Send".

🕔 S5066 Console				
		_		×
ïle Server View				
con 5066 Node 1 × Icon 5066 Node 2 Icon 5066 Node 3				
Peers Throughput Chats Trace				
Icon 5066 Node 2 Icon 5066 Node 3				
11:53:05 Icon 5066 Node 1: Hello Node 2				^
Say:	Send	Mode:	ARQ	~
✓ Connected to localhost:5066			Co	onnect
eceive Operator Chat Message at Node 2 S5066 Console File Server View		_		×
con 5066 Node 1 Icon 5066 Node 2 X Icon 5066 Node 3				
Peers Throughput Chats Trace				
Icon 5066 Node 1 Icon 5066 Node 3				
11:54:22 Icon 5066 Node 1: Hello Node 2				~
Save	Send	Mode	ARO	~
Say:	Send	Mode:	ARQ	>

What Next?

More information on Icon-5066 can be found on the Isode website at *https://www.isode.com/product/stanag-5066-server/.*

Whitepapers

Isode regularly publishes whitepapers on technical and market topics related to its products. A full list of these can be found at *https://www.isode.com/whitepapers/*.

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