Kalki.IO Edge AMI Installation and Licensing



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1. Introduction

Kalki.io Edge (KIOE) is a protocol gateway software with capability to collect data from field devices over many legacy and standard protocols and convert the data in to any other desired protocols. KIOE AMI on AWS brings capability to collect field device data directly to AWS and use other AWS services to process the data. It allows to provision KIOE on EC2 instances.

This document guides to use KIOE on EC2. Section 2 describes provisioning KIOE on AWS EC2. Section 5 describes procedure to license KIOE.

2. KIOE AMI

This section will guide you to provision KIOE AMI on your account. KIOE AMI is available <u>here</u> on AWS Marketplace

2.1 KIOE AMI Subscription

1. Subscribe to KIOE AMI by clicking on **Continue to Subscribe**. KIOE AMI is free for evaluation however you may get charged for AWS resources like compute, storage etc.

KOIKI.IO	By: ASE/ Kalkitech 🗗 Latest Version: 4	1.14.0_beta		Save to List
Eoge	Software to Monitor, Control and Translate Utility Protocols and 80% of Industrial Pro Linux/Unix BYOL Free Tier	e protocols at the Edge, which	n covers 100% of all	Typical Total Price \$0.012/hr Total pricing per instance for services nosted on t2.micro in US East (N. Arginia). View Details
Overview	Pricing	Usage	Support	Reviews
Product Ove	erview			
Kalkija Edag (KIQE) is an	odgo coffuero ucod in Industrias, utilitios to p	agaitar		
Kalkiio Edge (KIOE) is an control and translate dat SCADA systems. This soft Cloud Platforms directly	edge software used in Industries, utilities to n a from field devices, sensors and OT systems s tware is also used for integrating OT data with or through a data hub.	nonitor, such as Highlig n IoT or • Tested device:	hts I with 5000+ type of OT & IT s/sensors/equipment/software	

2. Successful subscription will take you to Subscription page. Read and Accept EULA for Kalki.ioEdge. **Note**:: It may take some time for subscription request to complete.



3. Select KIOE **Version** and **Region** of your choice. You can see corresponding Monthly bill Estimation on right hand side. This Estimation is for **t2.micro**.Click on **Continue to Launch** to move to next step.

Note: Estimation does not include KIOE license price.

Kalki.io Edge AMI	Continue to Launch
<product <u="" detail="" subscribe="">Configure Configure this software</product>	Pricing information
Choose a fulfillment option and software version to launch this software. Fulfillment option 64-bit (x86) Amazon Machine Image (AMI)	This is an estimate of typical software and infrastructure costs based on your configuration. Your actual charges for each statement period may differ from this estimate. Software Pricing
Software version 4.14.0 (Feb 18, 2022)	Kalikijo Edge \$0/hr AMI BYOL running on 12 mice
Region US East (N. Virginia)	Infrastructure Pricing EC2: 1 * t2.micro Monthly Estimate: \$8.00/month

 AWS provides two methods of launching new instance. Launch from Website and Launch through EC2. Section 2.2 Explains provisioning KIOE AMI from Website. Section 2.3 explains launch through EC2. If you are new to AWS and provisioning an EC2 instance for the first time then it is recommended to use Launch From Website.

2.2 KIOEAMI Provisioning from Website

1. Set Launch Action to Launch from Website.

Kalki.io Edge AMI	
Choose Action	
Launch from Website 🗸	Choose this action to launch from this website
EC2 Instance Type	
t2.micro 🗸	Memory: 1 GiB CPU: 1 virtual core Storage: EBS storage only Network Performance: Low to Moderate
VDC C-44	

- 2. This will bring several settings on the same page regarding KIOE AMI launch configuration.
- 3. Select VPC for launch. This VPC should have at least one subnet with public access. **Note:** If you have not yet created any VPC in your account then default VPC will have subnets with public network access. This VPC can be selected for KIOE.
- Select public subnet of your VPC.
 Note: If you are using default VPC then all subnets are public.

Edge Kalki.io Edge	ge AMI		
PC Settings			
indicates a default vpc			
Vpc-02115378	v a		
vpc-02113876			
reate a VPC in EC2 🗷			
ubnet Settings			
ubnet Settings subnet-4ee0da60 (us-east-1c)	× 3	IPv4 CIDR block: 172.31.80.0/20	
ubnet Settings subnet-4ee0da60 (us-east-1c)	~ C	IPv4 CIDR block: 172.31.80.0/20	
ubnet Settings subnet-4ee0da60 (us-east-1c) Select a subnet	v ₽	IPv4 CIDR block: 172.31.80.0/20	
ubnet Settings subnet-4ee0da60 (us-east-1c) Select a subnet subnet-4ee0da60 (us-east-1c) subnet-8107c8cc (us-east-1d)	v €	IPv4 CIDR block: 172.31.80.0/20	
ubnet Settings subnet-4ee0da60 (us-east-1c) Select a subnet subnet-4ee0da60 (us-east-1c) subnet-8107c8cc (us-east-1d) subnet-2020d12e (us-east-1f)	v €	IPv4 CIDR block: 172.31.80.0/20	
ubnet Settings subnet-4ee0da60 (us-east-1c) Select a subnet subnet-4ee0da60 (us-east-1c) subnet-8107c8cc (us-east-1d) subnet-2020d12e (us-east-1f) subnet-7b3d021c (us-east-1b)	× €	IPv4 CIDR block: 172.31.80.0/20	
ubnet Settings subnet-4ee0da60 (us-east-1c) Select a subnet subnet-4ee0da60 (us-east-1c) subnet-8107c8cc (us-east-1d) subnet-2020d12e (us-east-1f) subnet-7b3d021c (us-east-1b) subnet-90ecd4cc (us-east-1a)	× €	IPv4 CIDR block: 172.31.80.0/20	

5. KIOE AMIs security group must allow access to SSH TCP port(22) and KIOE Configuration TCP Port (1081). You can select your existing Security Group which allows these inbound connections by selecting one of available Security Group from Drop down in Select Security Group. You can create a new Security Group with above mentioned TCP ports open for inbound TCP connection by clicking on Create New Based on Seller Settings.

Security Group Settings		
A security group acts as a firewall that contr security group based on seller-recommende	ols the d setti	traffic allowed to reach one or more instances. You can create a new ngs or choose one of your existing groups. Learn more
Select a security group	~	c
Create New Based On Seller Settings		

This will bring a prompt to create Security Group. Fill Security Group Name and Description and click on save to create Security Group.

Security Group Settings

A security group acts as a firewall that controls the traffic allowed to reach one or more instances. You can create a new security group based on seller-recommended settings or choose one of your existing groups. Learn more

Create new based on seller settings

A new security group will be generated by AWS Marketplace. It is based on recommended settings for SyncConenct AMI version V4.5.0.

ance				
ance				
Protocol	Port Range	Source (IP or Grou	p)	
tcp	1081	Anywhere ~	0.0.0/0	
tcp	22	Anywhere ~	0.0.0/0	
s all IP addres	ses to access your ir	nstance. We recomm	end limiting acc	cess to only
	Protocol tcp tcp s all IP addres	Protocol Port Range tcp 1081 tcp 22	Protocol Port Range Source (IP or Group tcp 1081 Anywhere > tcp 22 Anywhere >	Protocol Port Range Source (IP or Group) tcp 1081 Anywhere > 0.0.0.0/0 tcp 22 Anywhere > 0.0.0.0/0

6. Select SSH key pair to be used for logging in to your EC2 instance. You can either select existing SSH key or create a new key.

ey Pair Settings		
o ensure that no other person has a	iccess to your so	ftware, the software installs on an EC2 instance with an EC2 key pair
nat you created.		
Select a key pair	~	8
reate a key pair in EC2 🗗		

If you do not have existing key then create new key pair by clicking on **Create New Key Pair in EC2** link. This will take you to following page as shown below. Click on create new SSH key. Give suitable name to your key and click on create. This will prompt to save key file. Save this file on your local machine.

	aws	Service	s v	Resource Gro	oups 🗸	*		¢
	Bundle Tasks	^	Crea	te Key Pair	Import Key	Pair Delete		
-	ELASTIC BLOCK STORE	6	Q	Filter by attribut	es or search	by keyword		
	Volumes	2						
	Snapshots			Key pair nan	ne	 Fingerprint 		
	Lifecycle Manager							
-	NETWORK & SECURITY							
	Security Groups							
	Elastic IPs							
	Placement Groups							
1	Key Pairs							
	Network Interfaces	í.						

Switch back to launch settings in AWS Marketplace launch page. Click on refresh button next to Select Key pair drop down. You should find your newly created key in dropdown.

Key Pair Settings			
To ensure that no other person has a that vou created.	ccess to your so	oftwa	re, the software installs on an EC2 instance with an EC2 key pair
SyncConnect_ssh_key	~	C	
Create a key pair in EC2 🗹			L

7. Click on **Launch** button to launch the KIOE AMI. You should see similar window stating successful launch



You can launch this configuration again below or go to the configuration page to start a new one.

8. It will take couple of minutes for KIOE AMI to be provisioned. You can find your instance information in Services -> EC2 -> Running Instances. Now you should go to Section 2.4 and validate KIOE AMI installation.

2.3 KIOE AMI Provisioning from EC2 console

It is assumed that you have already subscribed to KIOE AMI. Refer Section 2.1 for Subscription procedure. Follow these steps to install KIOE AMI through EC2 launch wizard

1. Select Launch through EC2 and click on Launch

Kalki.io ка Edge ка	alki.io Edge AMI
Product Detail Subscribe	Configure Launch
aunch this s	oftware
Review the launch config	uration details and follow the instructions to launch this software.
Configuration details	
Fulfillment option	64-bit (x86) Amazon Machine Image (AMI) Kalki.io Edge AMI running on t2-micro
Software version	4.14.0
Region	US East (N. Virginia)
Usage instructions	
Choose Action	
Launch through EC2	 Choose this action to launch your configuration through the Amazon EC2 console.

2. Select Instance type. It is recommended to use t2.micro for evaluation. You may choose any of the allowed instance types. For more information on Instance type selection refer Appendix A. Click on **Next Configure Instance Details** to move to next step.

1. Choose AMI	2. Choose Instance Type	3. Configure Instance	4. Add Storage	5. Add Tags	6. Configure Security Group	7. Review
---------------	-------------------------	-----------------------	----------------	-------------	-----------------------------	-----------

Step Z. Choose an instance type	Step	ose an Instand	e Type
---------------------------------	------	----------------	--------

particular prime		and a second				
0	General purpose	t2.nano	1	0.5	EBS only	
	General purpose	t2.micro Free tier eligible	1	1	EBS only	
	General purpose	t2.small	1	2	EBS only	
	General purpose	t2.medium	2	4	EBS only	
	General purpose	t2.large	2	8	EBS only	
	General purpose	t2.xlarge	4	16	EBS only	
	General purpose	t2.2xlarge	8	32	EBS only	

3. Select valid configuration for each entry. Make sure that KIOE AMI Instance have a public IP and Networking configuration allows it to be accessed publicly. Click on **Add Storage** to move to next step

Number of instances	(i)	1 Launch into Auto S	caling G	iroup (j)
Purchasing option	1	Request Spot instances		
Network	(i)	vpc-02115a78 (default)	~ C	Create new VPC
Subnet	(i)	No preference (default subnet in any Availability Zon	€∽	Create new subnet
Auto-assign Public IP	(j)	Use subnet setting (Enable)	~	
Placement group	(j)	Add instance to placement group		
Capacity Reservation	(i)	Open	C	Create new Capacity Reservation
IAM role	(1)	None	~ C	Create new IAM role
Shutdown behavior	(i)	Stop	~	
Enable termination protection	(1)	Protect against accidental termination		
Monitoring	1	Enable CloudWatch detailed monitoring Additional charges apply.		
Tenancy	(j)	Shared - Run a shared hardware instance Additional charges will apply for dedicated tenancy.	~	

- 4. Select Storage for KIOE AMI. Default 8GB General Purpose SSD should be sufficient for basic workloads. Click on **Add Tags** to move to next step
- 5. Add Tags as per your need. Click on **Configure Security Group** to move to next step.
- 6. Select existing Security Group or create a new one. SSH TCP Port (22) and KIOE Configuration TCP Port (1081) should be kept open for inbound connection. You can create new Security Group or select Existing Security Group. Following Window shows creation of new Security Group with required inbound connection.

1. Choose AMI	2. Choose Instance Type	3. Configure Instance	4. Add Storage	5. Add Tags	6. Configure Security Group	7. Review	
Step 6: Co A security group you want to set u security group of	is a set of firewall rules the up a web server and allow I r select from an existing or	y Group at control the traffic fo nternet traffic to reach the below. Learn more	r your instance. Of your instance, ad about Amazon EC	n this page, you Id rules that allo 2 security group	can add rules to allow specific w unrestricted access to the H ps.	c traffic to reach your instance. For HTTP and HTTPS ports. You can cre	example, if eate a new
	Assign a security gro	OSelect an exist	ecurity group i ing security group	0			
	Security group nar	ne: SyncConenct	AMI-V4-5-0-Auto	genByAWSMP-1			
	Descripti	on: This security	group was genera	ated by AWS Ma	rketplace and is based on rec	omm	
Туре (j)	Protocol (i)	Port Range (j)	Source (j)		Description (i)	
Custom TCP I	TCP	1081	Custom	✓ 0.0.0.0/0		e.g. SSH for Admin Desktop	8
SSH	~ TCP	22	Custom	v 0.0.0/0		e.g. SSH for Admin Desktop	8
Add Rule							

7. Click on **Review and Launch** to move to move to next step. Here you can review the launch configuration. If all configuration are as per required Click on **Launch** to launch the EC2 instance. You will prompted for SSH key. You can either select existing key or create a new key pair. Select your choice and Launch the instance.

2.4 Validating AMI Instance

These steps will help in validating whether KIOE AMI have been successfully provisioned with required permissions.

1. EC2 Instance instantiation Check: Navigate to Services -> EC2, In EC2 dashboard and open Running Instances. Select KIOE EC2 instance.





 Here you will see a list of EC2 instances. Make Sure that instance State for KIOE is Running and Status Checks have passed. if you have recently provisioned the KIOE AMI then it may take couple of minutes for **Status Checks** to come as **2/2 Checks Passed**. This confirms successful instantiation of KIOE AMI. Note down Public IPv4 Address of instance. This IP address will be used for configuring KIOE.

	Launch Instanc	ce 👻 Connect	Actions V									₫	Ð	۰
4	Q Filter by tag	gs and attributes or se	arch by keywor	d						0	< <	1 to 2	2 of 2	> >
	Name	 Instance 	ID 🔺	Instance T	ype 👻 Availability Zone	• Instance State •	Status Che	cks 👻	Alarm Sta	itus	Public	DNS	(IPv4)	•
		i-038c30a	80d1f919fe	t2.micro	us-east-1c	🥥 running	🥝 2/2 che	cks	None	5	ec2-18-	205-1	19-211	.co
	Instance: i-03	Status Checks	Public DNS	: ec2-18-20 Tags	05-149-211.compute-1.am	azonaws.com								
		Instance ID	i-038c30a80d	11f919fe		Public	DNS (IPv4)	ec2-18- 1.amaz	205-149-211 onaws.com	.comput	e-			
		Instance state	running			IPv	4 Public IP	18.205.	149.211					
		Instance type	t2.micro			_	IPv6 IPs	-						
		Elastic IPs				F	Private DNS	ip-172-3	81-92-173.ec	2.interna	al			
		Availability zone	us-east-1c				Private IPs	172.31.	92.173					
		Security groups	SyncConnect outbound rule	_SG. view int	oound rules. view	Secondary	private IPs							
		Scheduled events	No scheduled	events			VPC ID	vpc-021	15a78					
		AMI ID	SyncConnect b36f-9bef867 ami-0f520d90 (ami-002fa3f	_V4.5_AMI-9 1b9ba- 06c627c0d2. 9897b5abff)	c70fdf4-4ef3-4704- 4		Subnet ID	subnet-	4ee0da60					
		Platform	ы С			Network	interfaces	eth0						

3. Kalki.io Sign up and KIOE Licensing

Once KIOE AMI is provisioned you will require **KIOE License** to use KIOE.

Request on following link to get an evaluation license for KIOE. An account will be created for you in kalki.io (*us.kalki.io* or *in.kalki.io*) and the login credentials will be sent to you via email:

https://kalkitech.com/support/sales-support/kioelicense

NOTE: Add the message note as "**Request for KIOE AMI license reques**t" when sending the request. Usually it will take 1 business day to create an account.

3.1 Downloading SCT(Configuration Utility)

1. To obtain the SCT, login to your account in kalki.io (*us.kalki.io* or *in.kalki.io*) using your username and password. You will see a log in prompt as shown below.

2. Click on Resources then SCT as shown below

3. You will see a page as shown below. Select your Operating System, System Architecture(64 Bit/ 32 Bit). A list of SCT set ups will come in lower half of page

.	Software Info			. adding of the second
Resources		SyncConne	t Configuration Tool	
	8	Configuration Tool for SyncConnect	Downloads Version : 4.10.0 Rating: * * * * * Operating System Windows 10 v Select Package Type Select Package Type v	0 Downloads Reviews (0) Select CPU 64-Bit v Select Release Type released v writoad
	Available Versions			
	Version Name	Description	Release Type	Action

Click on Download Action for SCT.

4. Install SCT on a Windows Machine. This machine will be used for configuring KIOE.

3.2 Downloading KIOE Device License

KIOE Licenses can be downloaded from the account in *kalki.io*. Follow these steps to download KIOE Licenses.

- 1. Log in to your kalki.io account.
- 2. Go to Devices Section. You may need to expand the top bar.

Home	Dashboard S	etup Help	Resources		
lome 🛛				Subscriptions Orders	
No Widgets Configured	1.			MDAS Device Data	
			Соруг	Devices	l Rights Reserved. 2
				Inbox Monitoring Reports	
	Home	Home Dashboard S	Home Dashboard Setup Help	Home Dashboard Setup Help Resources	Home Dashboard Setup Help Resources Image: Dashboard Setup Help Resources 1 Subscriptions Orders Orders MDAS Device Data MDM Copy Devices Inbox Monitoring Reports Reports

3. Go to SYNC (Manage Devices) Section as shown below

Device Templates Manage Device Templates	Devices	Meters	SYNC Manage SYNC Devices
A			

4. Select Kalki.io Edge

SYNC		AB	DC	~ ?
Series				•
SI.No.	Series	Nos.	Action	
1	Kalki.io Edge	8	≡	
2	SyncConnect	19	≡	

5. You will see a list of KIOE available in your account. Click on actions -> License & Certificate -> Device License. Enter password for you certificate and save the license. This password will be used later while installing licenses to device.

Ser	ies Dev	ices					1000	•	
	SI.No.	Serial No.	Device Name	Model	License Type	Creation Time	Connection Status	on State	Actio
	1	2300005KA2112P00002	2300005KA211 2P00002	KIOE 2300-M1	Perpetual	Dec 20, 2021 4:36:43 PM (+0530)	Offline	Settings ~	Ē
	2	2300M01KA2109P00001	2300M01KA21 09P00001	KIOE 2300-M1	Evaluation	Sep 30, 2021 2:14:56 PM (+0530)	Offline	Update ~ Manage ~	1
	3	0200M01KA2109P00001	0200M01KA21 09P00001	KIOE 200- M1	Evaluation	Sep 6, 2021 12:18:18 PM (+0530)	Offline	Configuration ~ Diagnostics ~	
	4	2300M01KA2108P00001	2300M01KA21 08P00001	KIOE 2300-M1	Perp	wnload Authentication Ce	rtificate	License & Certificate	~
	5	0200M01KA2108P00001	0200M01KA21 08P00001	KIOE 200- M1	Eval & Ser	nd License to Device nerate License		Lej Remote Access	
	6	2300M01KA2107P00003	2300M01KA21 07P00003	KIOE 2300-M1	Even 📥 Dev	rice License ense Download Logs		provisioned	≡
	7	3000M01KA2107P00004	3000M01KA21	KIOE	Eval	PM (+0530)	ownload Logs	provisioned	≡

3.3 Installing KIOE Licenses on to AMI

Once license files are downloaded from kalki.io, they can be installed in the KIOE host. This section will explain how to install and verify KIOE licenses on AMI.

1. Launch SCT from start menu and Add *KIOE* device in the configuration as shown below.

SyncConnect Configurator	
File View Configuration Settings Diagnostics Tools Preferences Help	
Configuration Devices Add Device to Project KIOE VGA SyncConnect SYNC2000 SYNC2300	23 guration
Add Can	cel

This will add **KIOE** device in left Pane's device tree. Select this device. Go to **Device** License. Click on Install License to Device.

Browse the license downloaded in Section 4.2.

				1
License File	C:\Users\Vil	kash\Dow	nloads\CON	Browse
Password ²	**			
Download from	n kalki.io	3	Import	Exit

You will see License information. Click on OK to move to next step. Following prompt will appear for IP address of KIOE. Here provide IP address of KIOE host.

stall License										com		
Device	vice SS1 ~			SYNCConnect-M1								
IP Address	Use LA	N IP	~	18	. 1	205	. 149		211		Public DNS (IPv4)	ec2-18-205-149-211.compute 1.amazonaws.com
						_		_			IPv4 Public IP	18.205.149.211
							OK		Cancel		IPv6 IPs	-
Press Ok Button to Install License								Private DNS	ip-172-31-92-173.ec2.internal			
Availability zone us-east-1c						Private IPs	172.31.92.173					
Security gr	oups	SyncConnec	ct_SG. \	view inbou	und ru	les. v	view			Se	econdary private IPs	

You should get following prompt. KIOE will restart after this operation. Wait for a minute and move to next step.

This step verifies **KIOE version**. In SCT toolbar go to **Settings -> Version Information**. Provide IP for KIOE host and press OK.

If you get version for software in **Version Info** tab, this confirms successful installation of KIOE Licenses.

You can get more information about licensed protocols in License Info tab.

cense Info Version Info System Info					
pps					
SyncConnect Version	4.14.0-Sp.5+2518				
SyncConnect Build date	7 Sep 2021 19:07:28				
SYNC API Version	1 2.1-2018 4.14.0-Sp.5+2447				
CSIP Version					
SyncConnect Configurator Version					
SyncConnect Configurator Build Date	September 1,2021				

Appendix A

KIOE linearly consumes more resources as number of tags in operation increase. Following Sections provides Compute resources required for tag counts.

A.1 Tag count to EC2 Instance type

Following table gives tag count to instance type. It is recommended to use t2 instances for most workloads. Same t3 instances can be used for workloads requiring high network throughput.

Serial Number	Tag Count	Instance Type	Instance Type (with ICCP or IEC 61850)
1	0 - 500	t2.micro	t2.small
2	500-1000	t2.small	t2.medium
3	1000-2000	t2.medium	t2.large
4	2000-5000	t2.large	t2.xlarge
5	5000 - 10000	t2.xlarge	t2.2xlarge

A.2 Tag count to ECS Memory and Process units

Following table gives CPU and RAM units required in ECS containers

Tag Count	CPU(Units)	RAM(MB)	ICCP and IEC 61850 tags		
			CPU(Units)	RAM(MB)	
0 - 500	512	512	1024	1024	
500-1000	512	1536	1024	3048	
1000-2000	1024	3048	2048	5120	
2000-5000	2048	5120	3048	7168	
5000 - 10000	3048	8192	4096	8192	
	Tag Count 0 - 500 500-1000 1000-2000 2000-5000 5000 - 10000	Tag CountCPU(Units)0 - 500512500-10005121000-200010242000-500020485000 - 100003048	Tag CountCPU(Units)RAM(MB)0 - 500512512500-100051215361000-2000102430482000-5000204851205000 - 1000030488192	Tag Count CPU(Units) RAM(MB) ICCP and IEC 0 - 500 512 512 1024 500-1000 512 1536 1024 1000-2000 1024 3048 2048 2000-5000 2048 5120 3048 5000 - 10000 3048 8192 4096	