



QUICK START GUIDE

# VIA SOM-9X50-STK

Amazon KVS



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## Revision History

Version	Date	Remarks
1.01	16/08/2023	Added new descriptions in section 1 for introducing VIA SOM-9X50 module and the VIA VAB-950 carrier board. Updated descriptions in section 2.2 for setting up an AWS account and creating an AWS access key. Updated descriptions in section 2.3 for setting up the developer environment. Updated descriptions in sections 2.4 and 2.5 for connecting with the Yocto 3.1 and Android 10.0 EVKs.
1.00	09/03/2023	Initial release

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# 1. Introduction

This document provides instructions on how to set up Amazon Kinesis Video Streams (Amazon KVS) to connect with VIA SOM-9X50-STK devices.

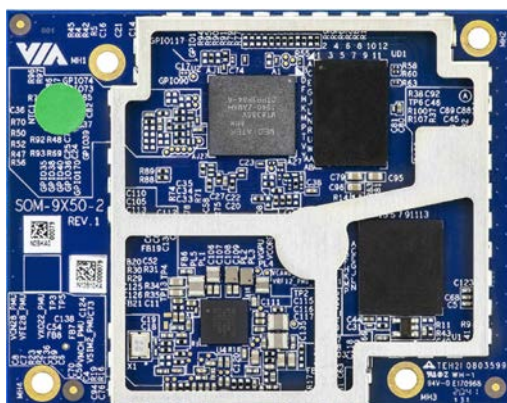
**Note:**

The VIA SOM-9X50-STK includes the VIA SOM-9X50 module and the VIA VAB-950 reference carrier board.

## 1.1 VIA SOM-9X50 Module

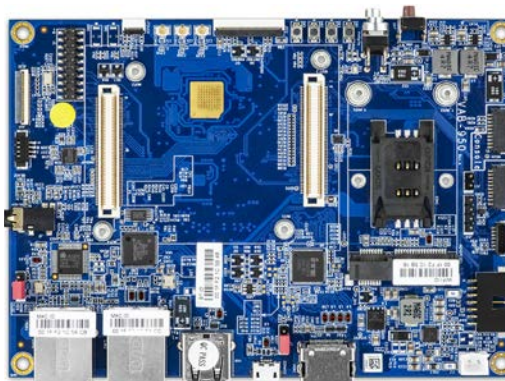
The VIA SOM-9X50 module is powered by the high-performance octa-core MediaTek Genio 500 SoC, with upto 4GB LPDDR4 SDRAM and 16GB eMMC flash memory in a compact form factor to deliver blistering edge processing and multimedia performance. Besides quad-core ARM Cortex-A73 and quad-core Cortex-A53 processors, the Genio 500 SoC also includes:

- An integrated AI processor, for deep learning, neural network acceleration, and computer vision applications, including facial recognition, object identification, and OCR.
- Hardware-accelerated graphics processing and full HD H.265/H.264 video decoding.



## 1.2 VIA VAB-950 Carrier Board

Combining the optional VIA VAB-950 Carrier Board offers a wide variety of wireless and I/O connectivity options, such as an integrated SIM card slot for LTE/4G, dual-band 802.11ac Wi-Fi, 10/100Mbps Ethernet ports, Bluetooth 5.0, USB 2.0 and Micro USB 2.0 ports. Additional HDMI, MIPI DSI, and MIPI CSI-2 interfaces with multi-function pins for I<sup>2</sup>C, SPI and GPIO provide support for display and camera connectivity, making it the ideal solution for an unlimited array of home, commercial, industrial, and educational applications and use cases.



Refer to the datasheet and user manual on the [VIA SOM-9X50 product page](#) for detailed information.

## 1.3 Directing Data from a VIA SOM-9X50 Device to Amazon KVS

To direct data from VIA SOM-9X50-STK devices to your AWS cloud implementation, an Amazon KVS service must be set up and configured to receive data from the devices. An AWS access key is required for Amazon KVS to connect a device to the AWS backend.

Follow the steps listed in [section 2.2](#) to create an AWS access key for Amazon KVS. The access key (\*.csv) for the desired user ID will be created as described in [Step 8](#).

## 2. Connecting to Amazon KVS

### 2.1 Introduction

This section provides instructions on how to establish a connection between a VIA SOM-9X50-STK device and Amazon KVS service, including how to acquire an AWS access key for Amazon KVS, set up the VIA SOM-9X50-STK device, and connect the device to the Amazon KVS using the VIA SOM-9X50-STK Yocto or Android EVK.

### 2.2 Set Up Your AWS Account and Create an AWS Access Key

#### Step 1

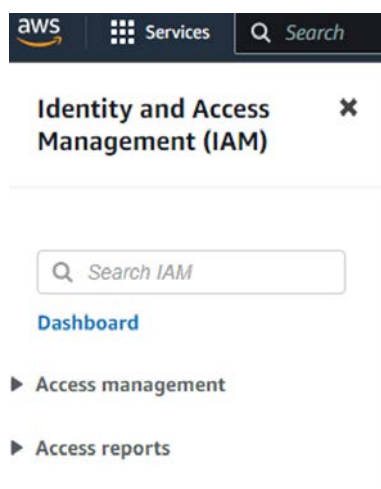
Refer to instructions in the following sections of the [Amazon KVS account setup webpage](#):

- Sign up for an AWS account
- Create an administrative user
- Create an AWS account key

Pay special attention to the Notes on the webpage.

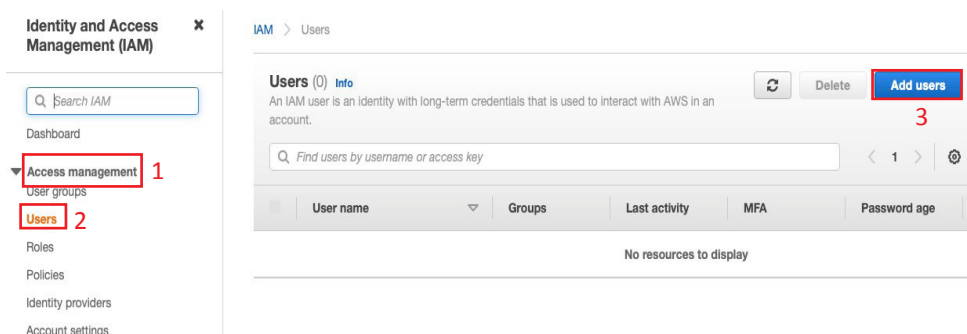
#### Step 2

Sign in as an IAM user and access the [IAM console](#).



#### Step 3

Click on "Access management/Users" and then click on the "Add users" button in the right panel.



## Step 4

To add a user, enter a preferred name in the "User name" field, select "Programmatic access" in the "Select AWS access type" section and click on the "Next: Permissions" button to proceed to set permissions.

Add user



Set user details

You can add multiple users at once with the same access type and permissions. [Learn more](#)

User name\*  1

[Add another user](#)

Select AWS access type

Select how these users will access AWS. Access keys and autogenerated passwords are provided in the last step. [Learn more](#)

- Access type\*
- ☒ **Programmatic access**  
Enables an **access key ID** and **secret access key** for the AWS API, CLI, SDK, and other development tools. 2
  - ☐ **AWS Management Console access**  
Enables a **password** that allows users to sign-in to the AWS Management Console.

\* Required

[Cancel](#)

[Next: Permissions](#) 3



## Step 5

To set permissions, click on "Attach existing policies directly", click on the Policy name "AmazonKinesisVideoStreamsFullAccess" and click on the "Next: Tags" button to proceed to add tags.



### Note:

The examples in this document are only intended only for developer environments. All VIA SOM-9X50 devices in your production environment must have credentials with privileges to authorize only intended actions on specific resources. The specific permission policies can vary for your use case. Identify the permission policies that best meet your business and security requirements. Refer to these [Example policies](#) and [Security Best practices](#) advised by AWS for more information.

Add user

1
2
3
4
5

Set permissions

Add user to group

Copy permissions from existing user

Attach existing policies directly
1

Create policy

Filter policies
KinesisVideo
Showing 2 results

	Policy name	Type	Used as	Description
<input checked="" type="checkbox"/>	AmazonKinesisVide...	AWS managed	None	Provides full access to Amazon Kinesis Vide... 2
<input type="checkbox"/>	AmazonKinesisVide...	AWS managed	None	Provides read only access to AWS Kinesis V...

Set permissions boundary

Cancel
Previous
Next: Tags
3

## Step 6

To add tags, enter relevant user information (e.g., email address, job title) or name only in the "Key" field and click on the "Next: Review" button to review your choices.



### Note:

Adding tags is optional. Refer to this [AWS IoT Core Developer Guide webpage](#) for more information on tagging your IoT resources.

### Add user



### Add tags (optional)

IAM tags are key-value pairs you can add to your user. Tags can include user information, such as an email address, or can be descriptive, such as a job title. You can use the tags to organize, track, or control access for this user. [Learn more](#)

Key	Value (optional)	Remove
1 <input type="text" value="Add new key"/>	<input type="text"/>	

You can add 50 more tags.

Cancel

Previous

2 **Next: Review**

## Step 7

This page displays all the settings to be reviewed, including the User name, AWS access type and permissions boundary. To finish creating the user ID, click on the "Create user" button.

Add user

1
2
3
4
5

Review

Review your choices. After you create the user, you can view and download the autogenerated password and access key.

User details

User name	VIA-KVS-SDK
AWS access type	Programmatic access - with an access key
Permissions boundary	Permissions boundary is not set

Permissions summary

The following policies will be attached to the user shown above.

Type	Name
Managed policy	AmazonKinesisVideoStreamsFullAccess

Tags

No tags were added.

Cancel

Previous

Create user

## Step 8

Once the user ID has been created, a "Success" message will be displayed. Click on the URL in the message for more information on AWS management console access. The User name, Access key ID and the Secret access key are shown below the message. Click "Download.csv" to download the Secret access key file and then "Close" to finish.

Add user

1
2
3
4
5

**Success**

You successfully created the users shown below. You can view and download user security credentials. You can also email users instructions for signing in to the AWS Management Console. This is the last time these credentials will be available to download. However, you can create new credentials at any time.

Users with AWS Management Console access can sign-in at: <https://viatp2.signin.aws.amazon.com/console>

Download .csv

User	Access key ID	Secret access key
<div>   VIA-KVS-SDK </div>	AKIAWO2AXU6URD7WNNZ7	<div> <div>*****</div> <div>Show</div> </div>

Comprehensive documentation is provided by Amazon Web Services. Follow the AWS development guide to add Kinesis Video Streams with different settings on Amazon Web Services. Click [here](#) for more information on Kinesis Video Streams.

## 2.3 Set Up Your Development Environment

This section provides instructions to prepare the hardware and software required to set up your development environment.

### 2.3.1 Prerequisites

Following are the prerequisites for setting up the developer environment:

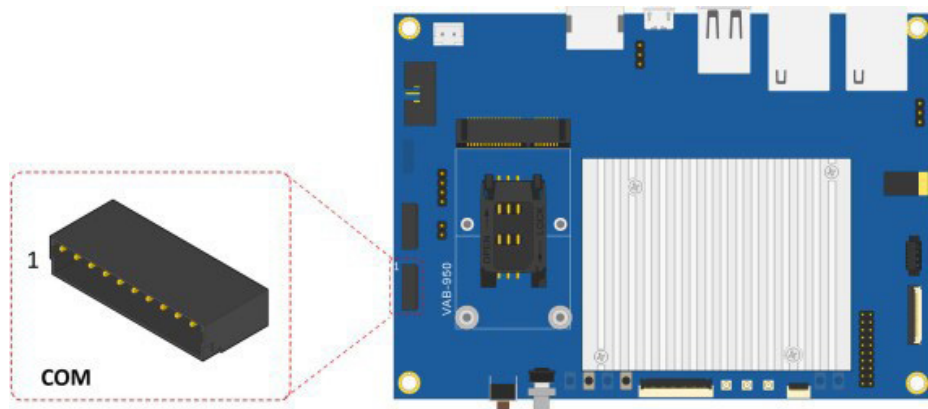
- The COM debug cable (provided) and a USB flash drive
- A serial port communication program like PuTTY or Tera Term

### 2.3.2 Setting up the VIA SOM-9X50-STK

Set up the VIA SOM-9X50-STK device as described below:

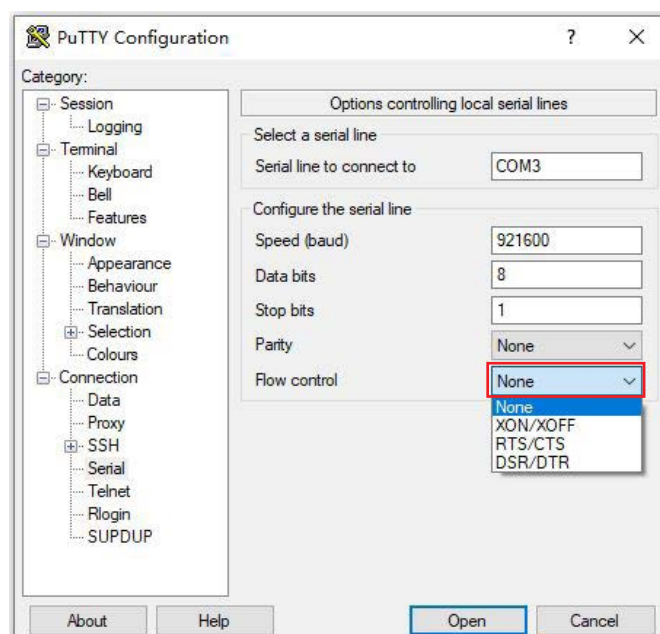
#### Step 1

Connect a host machine and the VIA SOM-9X50-STK through the onboard COM connector labeled as "COM".



#### Step 2

Use a serial port communication program such as PuTTY or Tera Term to connect the debug console. Set the console Baud Rate to "921600".



## 2.3.3 Download and Install a VIA SOM-9X50 EVK

The VIA SOM-9X50 BSP supports the Yocto 3.1 and Android 10.0 operating systems. To enable the hardware functions of a VIA SOM-9X50-STK device, download the Yocto 3.1 or Android 10.0 EVK from the [VIA SOM-9X50 product page](#) and install it on the device. Detailed instructions are available in the corresponding EVK Quick Start Guides featured on the same page.

### Software



**VIA SOM-9X50 BSP**

The VIA SOM-9X50 BSP supports Yocto 2.6 and Android 10.0. VIA SOM-9X50 Yocto 3.1 and Android 10.0 EVK packages to enable the hardware functionality can be downloaded here. A full set of software customization services that speed up time to market and minimize development costs is also available.

Yocto 3.1 EVK	[304.9 MB]	v1.1.0	2022-02-14
Android 10.0 EVK	[668.6 MB]	v1.4.0	2022-04-22

**Important:** By downloading these software packages, you indicate your acceptance of the [VIA Software License agreement](#). If you do not agree with any of the terms and conditions, do not continue to download the software.

### Documentation

Datasheet		2023-04-20
User Manual	v2.00	2021-11-18
STK Yocto 3.1 EVK Quick Start Guide	v1.01	2022-04-15
STK Android 10.0 EVK Quick Start Guide	v1.01	2022-05-06
AWS IoT Core Quick Start Guide	v1.02	2023-05-15
Amazon KVS Quick Start Guide	v1.00	2023-03-09
Product Gallery		

## 2.4 Connecting with the Yocto 3.1 EVK

The VIA SOM-9X50-STK Yocto EVK includes a "kvs\_demo.sh" application to help establish a connection between the VIA SOM-9X50-STK device and the Amazon KVS service.

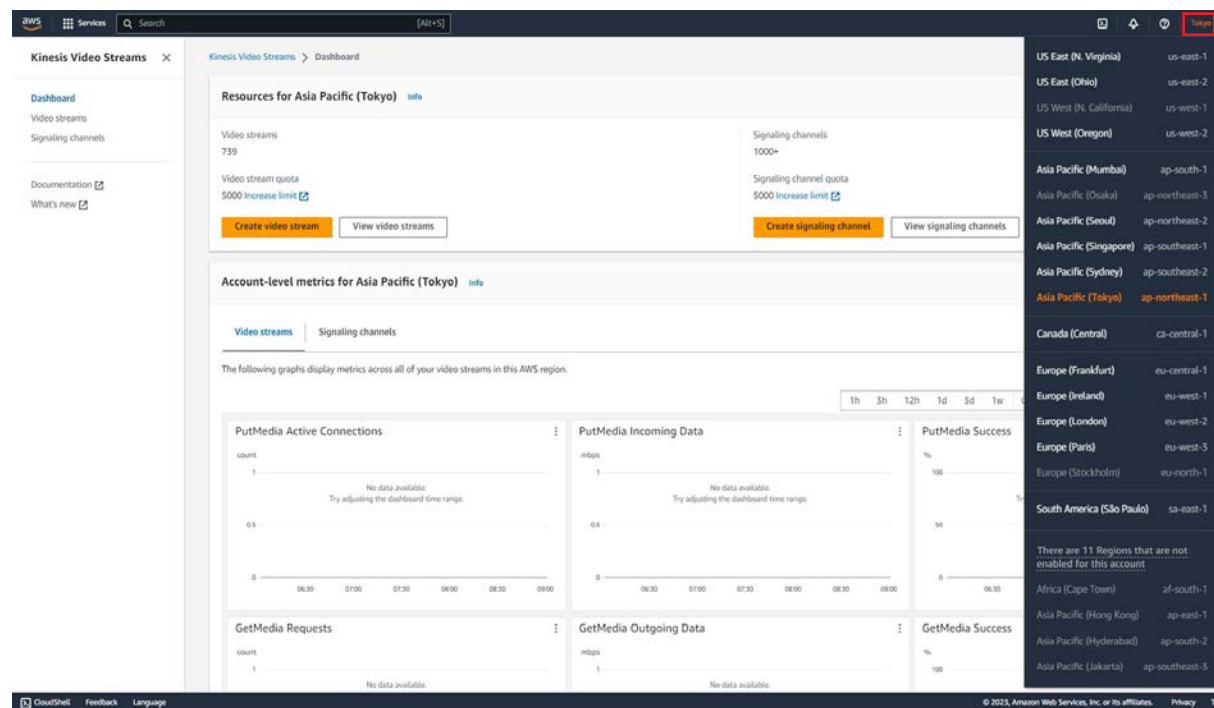
This section guides developers on how to enable and run the "kvs\_demo.sh" application.

### Step 1

Copy the Secret access key (\*.csv) file downloaded in [Step 8 of section 2.2](#) to the "/data" location.

### Step 2

Check the AWS Web console for the Region.



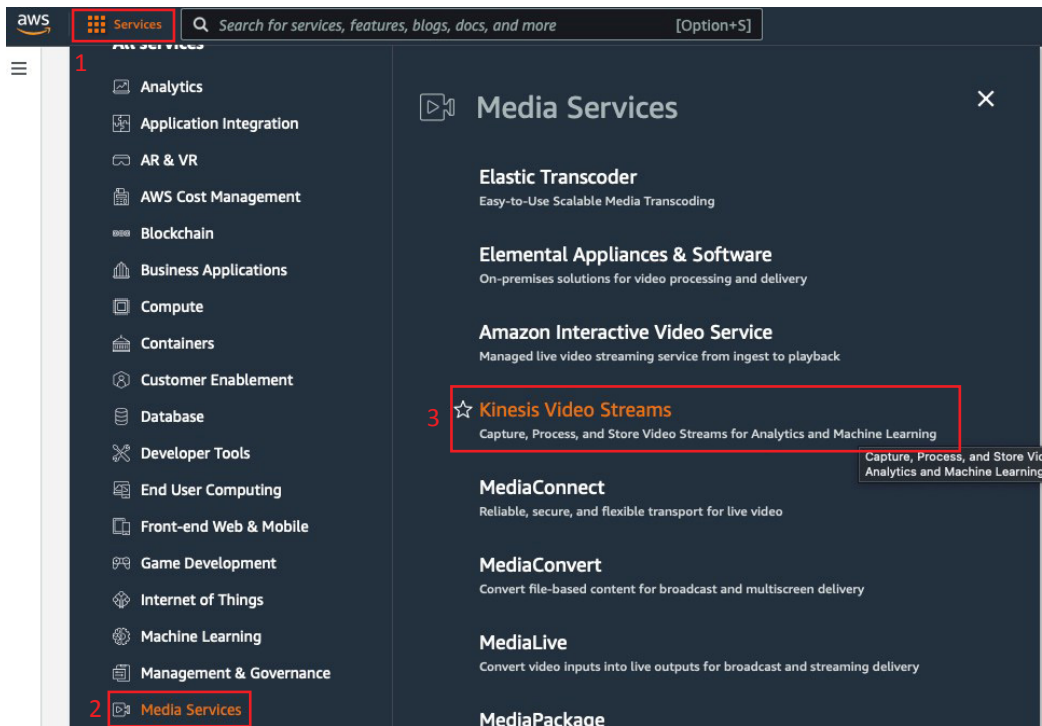
### Step 3

Run the "kvs\_demo.sh" script as shown below:

```
root@aiv8385-linux:~# kvs_demo.sh /data/ sh-sw-appl_accessKeys.csv "ap-northeast-1"
```

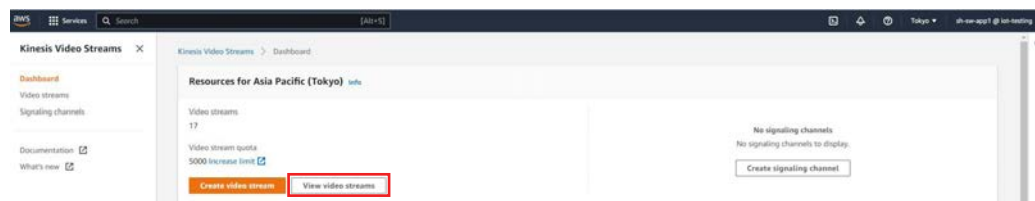
"sh-sw-app1\_accessKeys.csv" is the name of the Secret access key file in this example.

If there are no errors, there will be one KVS stream available. To view the stream, click on "Services" in the top menu panel and click on "Kinesis Video Streams" under the "Media Services" category.

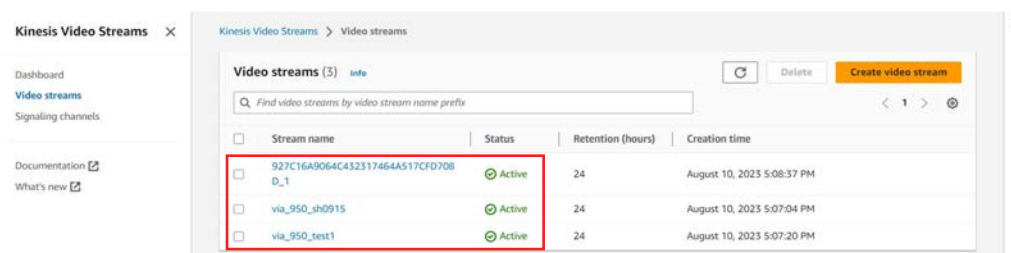


### Step 4

Next, click on 'View video streams' in the right panel.



The names, status, retention (in hours) and creation time of the KVS stream will be displayed.



Comprehensive documentation is provided by Amazon Web Services. Follow the AWS development guide to add Kinesis Video Streams with different settings on Amazon Web Services. Click [here](#) for more information on Kinesis Video Streams.

## 2.5 Connecting with the Android 10.0 EVK

The VIA SOM-9X50-STK Android EVK includes an "AmazonKinesisVideoDemoApp" application to help establish a connection between the VIA SOM-9X50-STK device and the Amazon KVS service.

This section guides developers on how to enable and run the "AmazonKinesisVideoDemoApp" application.

### Step 1

Download the source code from this [AWS SDK for Android repository](#).

### Step 2

Follow the instructions on the following Amazon Kinesis Video Streams Developer Guide webpages:

- [Running AmazonKinesisVideoStreaming Sample](#)
- [Download and configure the Android Producer Library code](#)

### Step 3

Change the "KINESIS\_VIDEO\_REGION" field value to your AWS Web console's Region in the sample code file "KinesisVideoDemoApp.java" at location "/src/main/java/com/amazonaws/kinesisvideo/demoapp".

```
14 public class KinesisVideoDemoApp extends Application {
15     public static final String TAG = KinesisVideoDemoApp.class.getSimpleName();
16     public static Regions KINESIS_VIDEO_REGION = Regions.US_WEST_2;
```

### Step 4

The default framerate is 20 and the default bitrate is 384 kbps. Change the "FRAMERATE\_20" and "BITRATE\_384\_KBPS" field values to your video streams' frame rate and bitrate in the sample code file "StreamConfigurationFragment.java" at location "/src/main/java/com/amazonaws/kinesisvideo/demoapp/fragment".

```
38 public class StreamConfigurationFragment extends Fragment {
39     private static final String TAG = StreamConfigurationFragment.class.getSimpleName();
40     private static final Size RESOLUTION_320x240 = new Size(320, 240);
41     private static final int FRAMERATE_20 = 20;
42     private static final int BITRATE_384_KBPS = 384 * 1024;
43     private static final int RETENTION_PERIOD_48_HOURS = 2 * 24;
```



**Step 5**

Sign in to the "AmazonKinesisVideoDemoApp" application. The "Stream Configuration" screen will be displayed.

**Step 6**

Fill in the Stream Name and select the Resolution as "1280x720", then scroll to the bottom and click the "Stream" button.

The screenshot displays the "Stream Configuration" screen of the AmazonKinesisVideoDemoApp. The interface includes a header bar with a hamburger menu icon on the left and a three-dot menu icon on the right. The title "Stream Configuration" is centered in the header. Below the header, the "Stream Name" field contains the text "demo-stream". The "Camera" dropdown menu is set to "Back Facing Camera". The "Codec" dropdown menu is set to "h264 (video/avc)". The "Resolution" dropdown menu is set to "1280x720". The "Rotate Camera Preview" dropdown menu is set to "0.0". At the bottom, there is a checkbox labeled "Maintain Preview Aspect Ratio" which is checked. The screen is displayed on a mobile device, as indicated by the Android navigation bar at the bottom.

Open a console (e.g. Putty) and configure as described in [section 2.3](#). The boot up messages will be presented with a command line interface as well as debug output. Use busybox commands "in /bin" to set up and debug the VIA SOM-9X50-STK device.

[illegible]

```
$ ls /bin
```

ash	chmod	dmccg	getopt	klogd-start	lsmod.kmod	mountutil-linux	rw	stty.coreutils	systemd-inhibit	umount
bash	chmod.coreutils	dmccg.util-linux	getopt.util-linux	kmod	mdclogd	mv	rm.coreutils	su	systemd-machine-id-setup	umount.util-linux
busbox	chown	dmccg.nmcli	getopt.nmcli	linux32	mkfs	mv.coreutils	rm	radir	systemd-notify	unacme
busbox.mosuid	chown.coreutils	dumpmap	gunzip	linux64	mkfs.coreutils	netstat	rmdir.coreutils	rmutil-linux	systemd-ysayers	unacme.coreutils
cat	cp	echo.coreutils	gzip	ln	mkfs	nuke	run-parts	sync	systemd-impfiles	upgrade_app
cat.coreutils	cp.coreutils	egrep	hostname	ln.coreutils	mkfs.coreutils	pidof	sed	sync.coreutils	systemd-tty-ask-password-agent	vsftpd
cat.coreutils	cpio	false	hostname.coreutils	login	mktemp	ping	sh	syslogctl	tar	watch
chattr	date	fastlog	inotifywait	login.shadow	more	ping6	sleep	syslog-start	touch	zcat
chattr.e2fsprogs	date.coreutils	journalctl	kill	more.util-linux	mount	ps	sleep.coreutils	systemctl	touch.coreutils	
chgrp	dd	fastlog	kill	mount	mountpoint	pwd	stat	systemd-ask-password	true	
chgrp.coreutils	dd.coreutils	fastlog_file	kill.coreutils	mountpoint	lscv	pwd.coreutils	stat.coreutils	systemd-escape	true.coreutils	
		fastlog_file	kill.coreutils	mountutil-linux	lscv	pwd.coreutils	stat.coreutils	systemd-hdps		

Check the table below for troubleshooting common Amazon KVS issues that may arise during development:

Issue	Solution
Device does not connect to the Internet	Confirm that the SIM card is inserted properly. Confirm that the SIM card is activated by the service provider. Verify the APN settings.
Device does not connect to AWS	Confirm that the date and time is synchronized. Verify that the appropriate access keys and region are configured on the VIA SOM-9X50-STK device. Verify the user policies or role set on AWS IAM.
Frame rate is too low	Try adding light if the lighting is too dim.



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