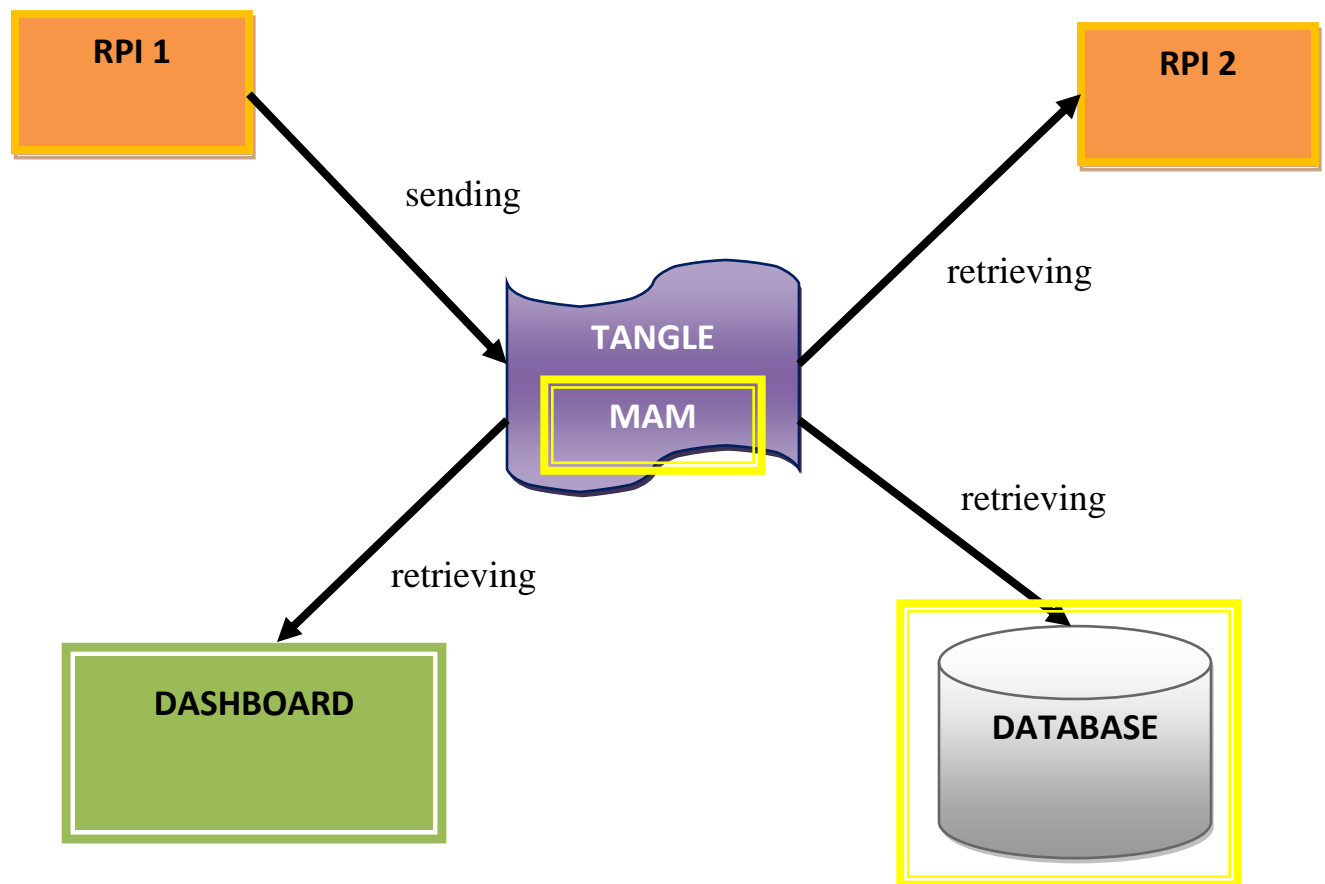


**IOTA**

**PROJECT CONTINUITY**

## WORKFLOW



\*the ones in yellow boxes are to be followed. Rest are fully functional.

## RASPBERRY PI 1

```
pi@raspberrypi: ~/Downloads/javascript version_v2/rpi1/rpi1
File Edit Tabs Help

NEW ADDRESS IS : JADHHDGKNTZSNJZZCEMNEJMNEJPSHCXAX0RWYVMMJIVCQMMPPQOMEBPKVCVEZZUFJCASP9MBJR0HXKQL
ZTIME IS Tue Oct 10 2017 07:10:54 GMT+0000 (UTC)
TRYTE MESSAGE : RBSBUA AND MQTT_MESSAGE IS : HI0 msg sent at Tue Oct 10 2017 07:10:54 GMT+0000 (UT
C)

INDEX IS : 0
Successfully made transfer for device id : RPI_1, with transaction ID: SNVZ0BXIMNFDWUDALTGMVBWFDQI
EZGNQFYQHZRQELHMKGWSOTWSKTBMIBHYFGWTKFHSELJ0PFW9HU999 with mqtt message string HI0 == HI0my times
tamp is : Tue Oct 10 2017 07:11:02 GMT+0000 (UTC)
my deviceid variables : HI0 msg in trytes RBSBUA
msg received Tue Oct 10 2017 07:11:02 GMT+0000 (UTC)

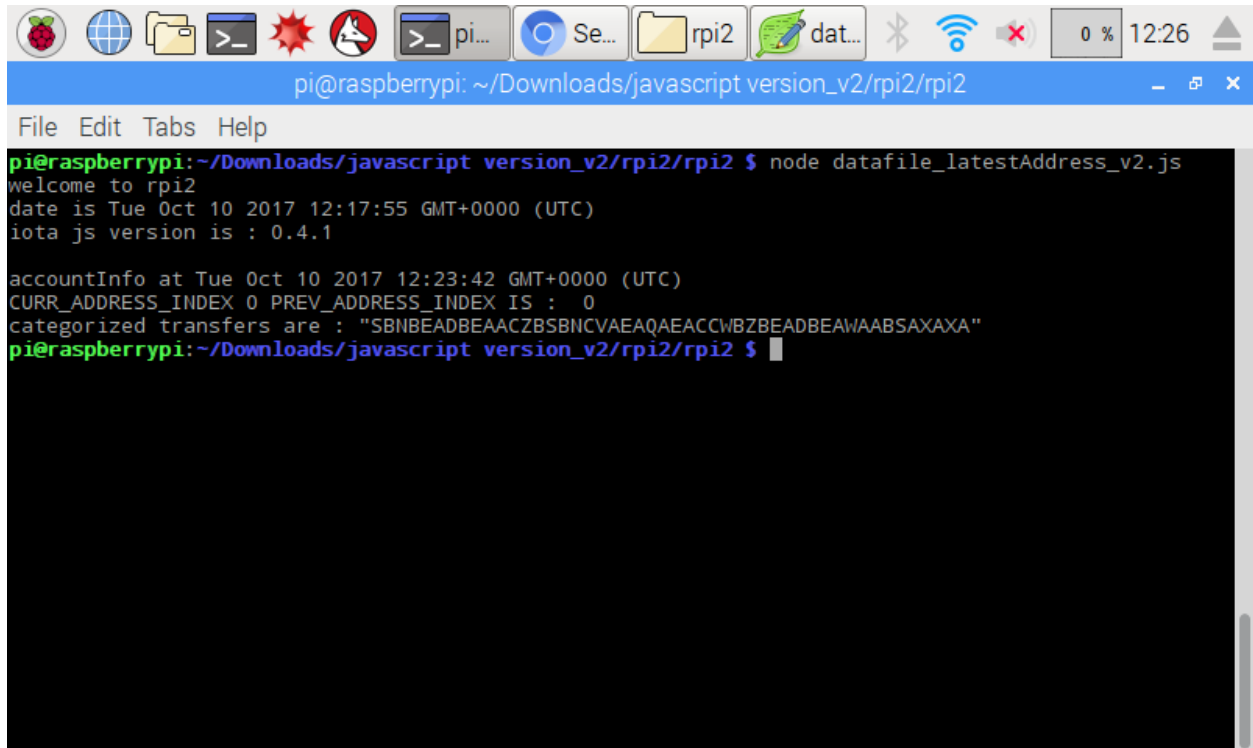
NEW ADDRESS IS : 0FQXHKSNI8MGLVXAKSCL9UQAK0XADWKGADRCIDFXEVAXLCLUTJCHJKYCWKJQR0LINDAEFRNBLEDNYF
BTIME IS Tue Oct 10 2017 07:12:10 GMT+0000 (UTC)
TRYTE MESSAGE : RBSBUAVA AND MQTT_MESSAGE IS : HI01 msg sent at Tue Oct 10 2017 07:12:10 GMT+0000
(UTC)

INDEX IS : 1
Successfully made transfer for device id : RPI_1, with transaction ID: FSDLPBCTQVFRBVPHYDIZTBCMEZW
UITAPUEJW9ETCMVEVUZYLTERVEP9YVWAA9AJWTP9IXT0ANJRVE999 with mqtt message string HI01 == HI01my tim
estamp is : Tue Oct 10 2017 07:12:14 GMT+0000 (UTC)
my deviceid variables : HI01 msg in trytes RBSBUAVA
msg received Tue Oct 10 2017 07:12:14 GMT+0000 (UTC)
^C
```

Flow:

1. We are sending sensor data at a frequency of 1 minute from Raspberry Pi 1 to the IOTA Tangle.
2. After every minute we increment the index to generate a new address for our given seed (Seed 1 belong to RPI 1). This maintains the security of our messages in the tangle.

## RASPBERRY PI 2



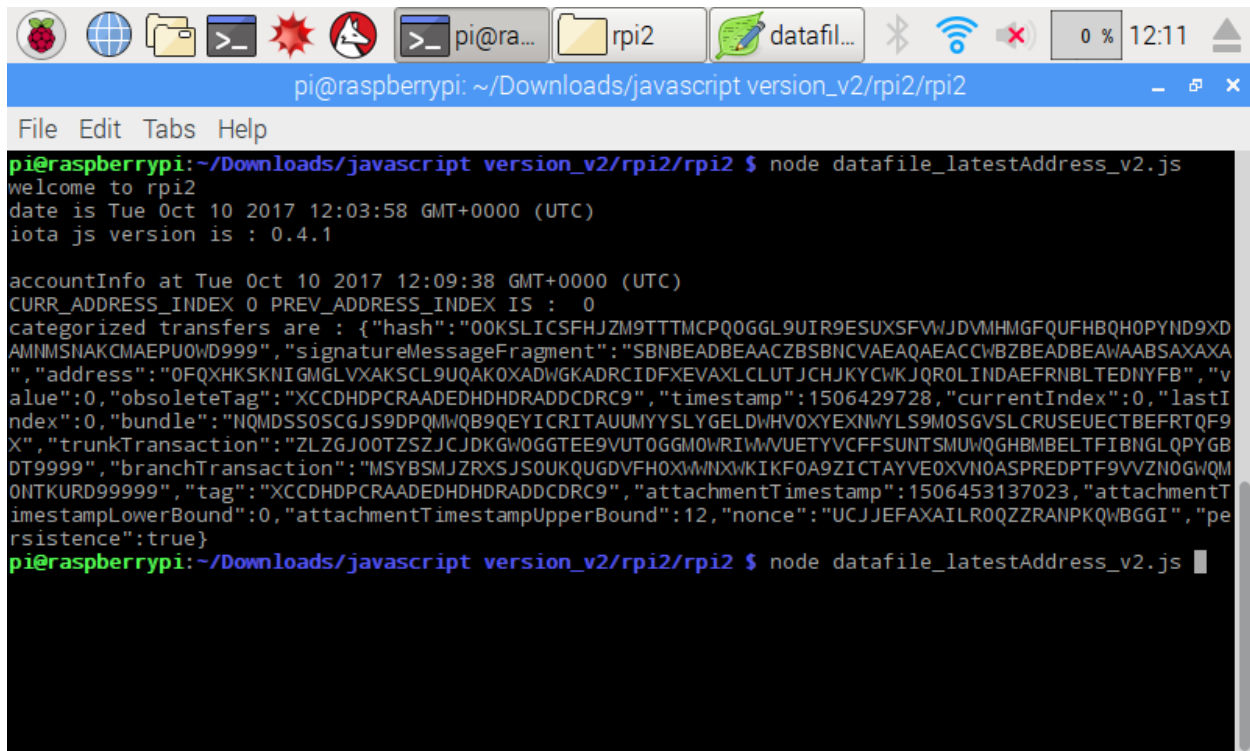
The screenshot shows a terminal window on a Raspberry Pi. The title bar indicates the user is 'pi' and the current directory is '~/Downloads/javascript version\_v2/rpi2/rpi2'. The terminal output shows the execution of a Node.js script named 'datafile\_latestAddress\_v2.js'. The script outputs a welcome message, the current date and time, the IOTA.js version, and account information. It also displays categorized transfers as a string of trytes.

```
pi@raspberrypi: ~/Downloads/javascript version_v2/rpi2/rpi2
File Edit Tabs Help
pi@raspberrypi:~/Downloads/javascript version_v2/rpi2/rpi2 $ node datafile_latestAddress_v2.js
welcome to rpi2
date is Tue Oct 10 2017 12:17:55 GMT+0000 (UTC)
iota js version is : 0.4.1

accountInfo at Tue Oct 10 2017 12:23:42 GMT+0000 (UTC)
CURR_ADDRESS_INDEX 0 PREV_ADDRESS_INDEX IS : 0
categorized transfers are : "SBNBEADBEAACZBSBNCVAAEQAEACCWBZBEADBEAWAABSAXXA"
pi@raspberrypi:~/Downloads/javascript version_v2/rpi2/rpi2 $
```

Flow:

1. We retrieve data from the tangle every minute.
2. Here I am retrieving the messages(in trytes) only if the current and previous addresses are different . That is , I am only capturing messages if addresses are different.




The screenshot shows a terminal window on a Raspberry Pi. The title bar indicates the current directory is `~/Downloads/javascript version_v2/rpi2/rpi2`. The terminal output shows the execution of `node datafile_latestAddress_v2.js`, which prints a welcome message, the current date and time, and the Iota.js version. It then displays a large JSON object representing account information, including the current address index, categorized transfers, and transaction details. The terminal prompt is `pi@raspberrypi:~/Downloads/javascript version_v2/rpi2/rpi2 $`.

```
pi@raspberrypi:~/Downloads/javascript version_v2/rpi2/rpi2 $ node datafile_latestAddress_v2.js
welcome to rpi2
date is Tue Oct 10 2017 12:03:58 GMT+0000 (UTC)
iota js version is : 0.4.1

accountInfo at Tue Oct 10 2017 12:09:38 GMT+0000 (UTC)
CURR_ADDRESS_INDEX 0 PREV_ADDRESS_INDEX IS : 0
categorized transfers are : {"hash":"00KSLICSFHJZM9TTTMCQPQ0GGL9UIR9ESUXSFVWJDVMHMGFQUFHBQHOPIYND9XD
AMNMSNAKMAEPUOWD999","signatureMessageFragment":"SBNBEADBEAACZBSBNCVAAEAQAEACCBZBEADBEAWAABSAXAXA
","address":"0FQXHKSNIIGMLVXAKSCL9UQAKOXADW/GKADRCIDFEXEAXLCLUTJCHJKYCWKJQR0LINDAEFRNBLTEDNYFB","v
alue":0,"obsoleteTag":"XCCDHDP CRAADEDHDDHADD CDRC9","timestamp":1506429728,"currentIndex":0,"lastI
ndex":0,"bundle":"NQMDSS0SCGJS9DPQMMWQB9QEYICRITAUUMYYSLYGELDWHV0XYEXMWYLS9M0SGVSLCRUSEUECTBEFRTQF9
X","trunkTransaction":"ZLZGJ00TZSJCDKGW0GGTEE9VUT0GGMOWRIWVUETYVCFPSUNTSMUWQGHMBBELTFIBNGLQPYGB
DT9999","branchTransaction":"MSYBSMJZRXSJSOUKQUGDVFH0XW/WXWIKF0A9ZICTAYVE0XVNOASPREDPF9VVZNOGWQM
ONTKURD99999","tag":"XCCDHDP CRAADEDHDDHADD CDRC9","attachmentTimestamp":1506453137023,"attachmentT
imestampLowerBound":0,"attachmentTimestampUpperBound":12,"nonce":"UCJJEFAXAILR0QZZRANPKQWBGGI","pe
rsistence":true}
pi@raspberrypi:~/Downloads/javascript version_v2/rpi2/rpi2 $ node datafile_latestAddress_v2.js
```

\*\*Also attached is the screenshot of all the information that we obtain from the tangle for every index

# DASHBOARD

 Welcome to IOTA Webpage					
Device id	Msg(trytes)	Status	Sent Time	Completed Time	Tx. id.
RPI_1 to RPI_2	SBNEADBEAACZBSBNCVAEAEACCBZBEADBEAWAABSAXAXA	Success	1506889673	1506889677131	RSOTZAGQDNRLFNZBNQ9MSTRGYEGICNGTLZVFBVXBSSTRSVQTUALXNENCMDDSMSEZMYN9BBSJZ9VD999
RPI_1 to RPI_2	SBNEADBEAACZBSBNCVAEAEACCBZBEADBEAWAABSAXAXA	Success	1506965297	1506965308540	NXKEWBXIMXQ9CKVZGHOXGOWNERQGRQXOUBADJHORNPHHNWYMRPHRTNSIQKGVBNTZSQBWHJ999
RPI_1 to RPI_2	RBSBUA	Success	1507035818	1507059228486	VGQOGUFPBDF9WUJWSXNLL9VNGQVZWVUWCYRGZKWKDYYVEBTOQKFCGCGYRVRBBKCQLGZMQGSPOMTL999
RPI_1 to RPI_2	RBSBUA	Success	1507035895	1507059305019	E9CUCDXOJPTANTBRUZQPCOIZYU9ZVUDVSQ9NTTFAQYZSYREFNXC9SVGTLRULWZECYLIPUCAOIVR999
RPI_1 to RPI_2	SBNEADBEAACZBSBNCVAEAEACCBZBEADBEAWAABSAXAXA	Success	1507544935	1507544942734	9VHMJAHFPZRB9BYBW9VWTLAOAIGUKLBJJCVCBRWARFPYJEDWGGGYM9ZFG9HTAOYFJQSJNNTYZZD999
RPI_1 to RPI_2	RBSBUA	Success	1507545678	1507545682122	IMZJMLQPOZSBAKTFEBDYWZNRB8TCOCXUJDXIYVCKWMPDRMYNUJQEYTBWVYUUSLVYPZKLTREJZV999
RPI_1 to RPI_2	RBSBUAWA	Success	1507545739	1507545743824	PGWHSJLWVWDCGXRLITCISAFBANRQKSRBTSAWIRN99HFMJGJAGEPEXMTSXHTWJVV9YRW9Z9NFAR999
RPI_1 to RPI_2	RBSBUAWAXA	Success	1507545799	1507545804534	IVWHJZSND9MSXGHMJFZDLWWS9S9NKS9JCIY9ZLUCTDRJQCQHWEIFPLKNSLGFHJZTVW9S9NSTF9VC999
RPI_1 to RPI_2	RBSBUAWAXAYAXA	Success	1507545860	1507545864207	WLN9RZDXMF9YQWJ9ZMJYMDZCPCBBGBIXGDTZBHYVVCUKHJTSULCMASHAXM9GOCARJRTSRTFC999
RPI_1 to RPI_2	RBSBUAWAXAYAXA	Success	1507545921	1507545925769	MJNOELGIBFSLGFRQBUEBEVGN9R9RLHWHUFWBQHOYLILAFMLUOQGCVDJTKXOWRNCWJUGUTHPHY9Q999
RPI_1 to RPI_2	RBSBUAWAXAYAXA	Success	1507545981	1507545986438	ATGPPSRB9HDBWAD9KZB9GBW9MJ9YXJ9QOKRDZ9SCUSM9V9W9AQSWOFG9BYMSJFZV9L9KJ9Z9TZ999
RPI_1 to RPI_2	RBSBUAWAXAYAXA	Success	1507546042	1507546046039	TILGEAPXTALZDZLWRY9HMYPCVK9TDSVTG9Q9IOJDMTAWK9G9RL9N9W9Q9M9N9B9U9AP9Z9Y9TAX9AX999
RPI_1 to RPI_2	RBSBUAWAXAYAXA	Success	1507546103	1507546107734	OMRVJTRKXP9PH9FISQRJTEVENZ9TKK9FEFV9APY9Z9QTDORMU9RL9UT9G9OU9JEF9L9Z9JL9G9WM9CEE9UW999
RPI_1 to RPI_2	RBSBUAWAXAYAXA	Success	1507546163	1507546168319	M9EZS9JHRJKA9W9R9QL9K9LTTUGO9UL9VL9SK9XDC9DEO9ERO9V9T9N9M9Y9L9UI9B9N9SA9W9K9X9W9D9R9J999
RPI_1 to RPI_2	RBSBUAWAXAYAXA	Success	1507546224	1507546227956	YQ9P9EEFDS9L9FREK9W9K9UZ9GMF9Z9H9T9S9W9O99Z9N9Z9V9G9V9E9Y9O9S9E9Y9PC9WR9PT9M9RAL9Q9Z9O9JWS9GF9C999
RPI_1 to RPI_2	RBSBUAWAXAYAXA	Success	1507546285	1507546289696	FPJ9RCS9K9PY9D9M9J9VR9XT9B9FM9HY9CR9Q9W9YES9CL9G9J9P9V9N9J9M9G9Y9PH9NK9Z9T9T9FC9Q9L9CV9Y9H9CH9L9Q9O9Z9AR999
RPI_1 to RPI_2	RBSBUAWAXAYAXA	Success	1507546345	1507546350397	9XU9RQ9SZ9CR9Z9UC9T9N9R9Z9N9J9K9N9W9O9J9B9Z9Y9E9DD9GL9U989R9H9A9FF9W9BR9W9O9CT9Y9F9O9E9U9H9K9B9T9B9N9SL999
RPI_1 to RPI_2	RBSBUAWAXAYAXA	Success	1507546406	1507546408464	UZ9W9Z9S9N9T9C9K9O9X9Y9G9G9X9PT9X9JL9Q9Y9M9G9H9M9O9F9V9Q9K9R9TX9P9R9E9Y9E9O9MA9J9F9Z9IS9G9CR9ZY9YA9J9H9Y9W9M9U9G9V9K999

Currently, the dashboard is a web service running at localhost. It can later be hosted on Heroku or Azure VM.

Flow:

1. We retrieve data from the tangle every minute.
2. Here I am retrieving data only if the current and previous addresses are different. That is, I am only capturing messages if addresses are different.
3. I am retrieving the following :
  - a. Device id , i.e., “RPI 1 to RPI 2”
  - b. Message in trytes (retrieved from Tangle)
  - c. Status of our transaction: “success” or “failure” . It’s a success if a tx. Hash is present in the transfer that is being retrieved
  - d. Timestamp at which the bundle was sent to the tangle
  - e. Timestamp at which the bundle was attached to the tangle
  - f. Tx hash/ Tx. Id

## SET UP DETAILS:

### RPI 1:

1. Install node js on your raspberry pi
2. Cd to rpi1
3. Iota.lib.js is already present , so no extra installations are required
4. Perform a “node datafile\_rpi1.js” to start the js application for pushing the temperature and id information from rpi1 to the tangle.
5. We can see the tx and indexes generated on the console window.

Something like this :

```
welcome to rpi_1

NEW ADDRESS IS : JADHHDGKNTZSNJZZCEMNEJMNEJPSHCXAXORWYWMJIVCQMMPPQ0MEBPKVCVEZZUFJCASP9MBJR0NXKQL
ZTIME IS Tue Oct 10 2017 07:10:54 GMT+0000 (UTC)
TRYTE MESSAGE : RBSBUA AND MQTT_MESSAGE IS : HI0 msg sent at Tue Oct 10 2017 07:10:54 GMT+0000 (UTC)

INDEX IS : 0
Successfully made transfer for device id : RPI_1, with transaction ID: SNVZ0BXIMNFDWUDALTGMVBWFDQI
EZGNQFYQHZRQELHMKGWS0TWSKTBMIBHYFGWVTKFHSELJ0PFW9HU999 with mqtt message string HI0 == HI0my times
tamp is : Tue Oct 10 2017 07:11:02 GMT+0000 (UTC)
my deviceid variables : HI0 msg in trytes RBSBUA
msg received Tue Oct 10 2017 07:11:02 GMT+0000 (UTC)

NEW ADDRESS IS : 0FQXHKSKNIGMLVXAKSCL9UQAK0XADWKGADRCIDFXEVAXLCLUTJCHJKYCWKJQROLINDAEFRNBLTEDNYF
BTIME IS Tue Oct 10 2017 07:12:10 GMT+0000 (UTC)
TRYTE MESSAGE : RBSBUAVA AND MQTT_MESSAGE IS : HI01 msg sent at Tue Oct 10 2017 07:12:10 GMT+0000
(UTC)

INDEX IS : 1
Successfully made transfer for device id : RPI_1, with transaction ID: FSDLPBCTQVFRBVPHYDIZTBCMEZW
UITAPUEJW9ETCMVEVUZYLTERVEP9YVWAA9AJWTP9IXT0ANJRVE999 with mqtt message string HI01 == HI01my tim
estamp is : Tue Oct 10 2017 07:12:14 GMT+0000 (UTC)
```

## RPI 2:

1. Install node js on your raspberry pi
2. Cd to rpi2
3. Iota.lib.js is already present , so no extra installations are required
4. Perform a “node datafile\_rpi2.js ” to start the js application for retrieving the temperature and id message from the tangle.
5. We can see the current address index along with the message(in trytes) from the tangle

Something like this :


```
CURR_ADDRESS_INDEX 0 PREV_ADDRESS_INDEX IS : 0
categorized transfers are : {"hash":"00KSLICSFHJZM9TTTMCPOGGL9UIR9ESUXSFVWJDVMHMGFQUFHBQH0PYND9XD
AMNMSNAKMAEPU0WD999","signatureMessageFragment":"SBNBEADBEAACZBSBNCVAEAEACCBZBEADBEAWAABSAXAXA
","address":"0FQXHKSKNIGMLVXAKSCL9UQAK0XADWKGADRCIDFXEVAXLCLUTJCHJKYCWKJQR0LINDAEFRNBLTEDNYFB","v
alue":0,"obsoleteTag":"XCCDHDP CRAADEDHHDHRAADD CDR9","timestamp":1506429728,"currentIndex":0,"lastI
ndex":0,"bundle":"NQMDSS0SCGJS9DPQMWQB9QEYICRITAUMYYSLSYGELDWHV0XYEXNWYLS9M0SGVSLCRUSEUECTBEFRTQF9
X","trunkTransaction":"ZLZGJ00TZSZJCJDKGW0GGTEE9VUT0GGM0WRIWVUETVVCFFSUNTSMUWQGHBMBELTFIBNGLQPYGE
DT9999","branchTransaction":"MSYBSMJZRXSJS0UKQUGDVFH0XMMNXWKIKF0A9ZICTAYVE0XVN0ASPREDPTF9VVZN0GWQM
ONTKURD99999","tag":"XCCDHDP CRAADEDHHDHRAADD CDR9","attachmentTimestamp":1506453137023,"attachmentT
imestampLowerBound":0,"attachmentTimestampUpperBound":12,"nonce":"UCJJEFAAILR0QZZRANPKQWBGGI","pe
rsistence":true}
```



## DASHBOARD :

1. Install nodejs on your system.
2. Cd to dashboard\_new\_gui
3. Perform a “npm install” to install all dependencies in package.json
4. Perform “npm start” on this directory. (runs datafile.js)
5. The service has started on “http://localhost:8882” (set in app.js)

We get something like this :

 Welcome to IOTA Webpage					
Device Id	Msg(trytes)	Status	Sent Time	Completed Time	Tx. Id.
RPI_1 to RPI_2	SBNEADBEAACZBSBNCVAEAGAEACCBZBEADBEAWAABSAXAXA	Success	1506889673	1506889677131	RSOTZAQDNRLFZNBQ9MSTRGYEGICNGTLZVFIBVXBBSSTRSVQTUALXNENCMDDSMSEZMVN9BSJZ9VD999
RPI_1 to RPI_2	SBNEADBEAACZBSBNCVAEAGAEACCBZBEADBEAWAABSAXAXA	Success	1506965297	1506965308540	NKKEWBXIMXQ9CKVKBZGOHDXGOWNERQOGRQXOUBADJHORNFNHNAYMRPAHRTNSIOKGVBTNZSQ8WHJ999
RPI_1 to RPI_2	RBSBUA	Success	1507035818	1507059228486	YGGQGUFPBDF9WUVWSXNLL9VNGQVZWVUWCYQZKWKDYYVEBTOQKFCFGCYRVRBBKCLGZMIQGSPOMTL999
RPI_1 to RPI_2	RBSBUAVA	Success	1507035895	1507059305019	E9CUCDXOJPTANTBRUJZPICOIZYU9ZVUDVSQ9NTTFBAQYZSYREFNXCBSVDGTLRLULWZCEYLIPUCAOIVR999
RPI_1 to RPI_2	SBNEADBEAACZBSBNCVAEAGAEACCBZBEADBEAWAABSAXAXA	Success	1507544935	1507544942734	9VHMJAHFPZRB8YBW9VWTLAOAIGUKLBJTJCVOCBRWARFPYJEDWGOGYM9ZF9HTAOYFJQSJNNTYZZD999
RPI_1 to RPI_2	RBSBUAVA	Success	1507545678	1507545682122	MZJMQLPQZSBAKFTFEBDYWZNRBTCOXCUIXDIYVCKWMPDRMYNJUQEYTBWVYYOULVPYKLTRE9JZV999
RPI_1 to RPI_2	RBSBUAIAWA	Success	1507545739	1507545743824	PGWHSJLWWDDCXRGILITCISAFBANRQKSRBTSAWIRN99HFMJJAGEPEXMTSXHTWJUV9YRW9Z9NFAR999
RPI_1 to RPI_2	RBSBUAIAWAXA	Success	1507545799	1507545804534	IWHJUSNDS9MSXGHMUFZDLWWSDS9NKSJUCIYW9ZLUCTDRJCQHWEIFPLKNSLGFHJZTVW9S9NSTNFVCI999
RPI_1 to RPI_2	RBSBUAIAWAXAYA	Success	1507545860	1507545864207	WLN9RRRZDXMVBVQWJSZMJYMDZKPCDCBBGBIXGDTZBHYYVCVKUHXJTSULCMASHAXMBGOCASQJRTSRTFC999
RPI_1 to RPI_2	RBSBUAIAWAXAYAZA	Success	1507545921	1507545925769	MJNOELGIBFSLGFRQBUEBEVGNR9BRLHWUHFQWQHOYLILAFMLUOGQCVDTJXKOWRNCWXJGUTHPHY9YQ999
RPI_1 to RPI_2	RBSBUAIAWAXAYAZA	Success	1507545981	1507545986438	ATGPPSRB9HDBWAD9IXZBGGBW9MJ9YXJQCKRDZ9SUCGMVJVWAQSWOFOGBYMSJFZVDULKJLZ9TIZ999
RPI_1 to RPI_2	RBSBUAIAWAXAYAZA	Success	1507546042	1507546046039	TILGEAPXTALTZDZLWRYHHMYPCKVKTDSTVTG9G9IOJDMTAWKGMRLNHWQCMN9BUAPZSYITAXRAXX999
RPI_1 to RPI_2	RBSBUAIAWAXAYAZA	Success	1507546103	1507546107734	OMRVJTRXPYPH9FISQRJTEVENZZTKKLEFEVSAPYZSQTDORMUJRL9UTBGOU9JEFPLZJLHGWMNCEEUWU999
RPI_1 to RPI_2	RBSBUAIAWAXAYAZA	Success	1507546163	1507546168319	M9EZS9JHRJKADIWSRQLKCLTTUGOULAVLSKVXDCDEOHEROV79NAMIYLTUBNSAWKAYAKWNPDRJIN999
RPI_1 to RPI_2	RBSBUAIAWAXAYAZA	Success	1507546224	1507546227956	YQ9PEEFDLSULFREKWKOUZGMFZHTISRWO9GZNVGVERYSUCEYXPCWPRWTMGRALQFZOSJWSGF9C999
RPI_1 to RPI_2	RBSBUAIAWAXAYAZA	Success	1507546285	150754629696	FPURCSOKJFVDPJUVJXVTYBFMHYCRPQWYESCL9JPFVHNJUMGYPHNKGZTTTFVQDLCVUYHQHCLGDOZAR999
RPI_1 to RPI_2	RBSBUAIAWAXAYAZA	Success	1507546345	1507546350397	SXURGQSZOCZUCITNSRZJNJKNSWODJBZAY9EDDGLI99BRHVAIFFWBRWGQCTIVYFOEGUHK98TBONSLS999
RPI_1 to RPI_2	RBSBUAIAWAXAYAZA	Success	1507546406	1507546409464	UZWDZSNBTKOKXYGGQXPTDZJLQYMGHOMOFVQUKRTXPRBEYEOAJSPFZJSGCRZYIYAJDHYWOMGVK999