



Troubleshooting Guide

ITEMSENSE 2017R1

INFORMATION AND GUIDANCE FOR TROUBLESHOOTING

This document provides information and guidance for troubleshooting Impinj's ItemSense 2017r1. Readers will find a catalogue of potential ItemSense symptom based issues linked to a list of the likely causes and resolutions.

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OVERVIEW

The following ItemSense troubleshooting guide catalogues a variety of technical issues based on real world experiences, with symptoms linked to a list of the likely causes and resolutions. By sifting through support incidences, trouble tickets, and engineering best practices, we collected customer problems and linked them to various identified causes, and resolutions for each of those causes.

You may refer directly to the [Procedures section](#) if you are already aware of the cause of an issue and are looking for specific information on how to perform a troubleshooting task.

TROUBLESHOOTING SYMPTOMS

Unable to Modify Reader NTP Settings

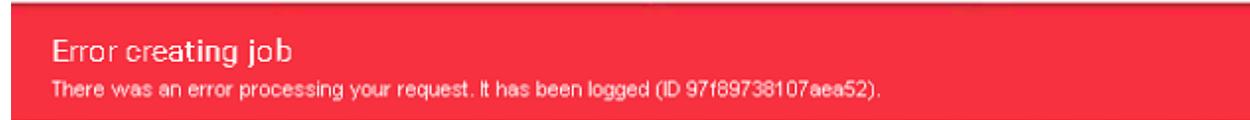
With Octane Firmware 5.10 and greater, NTP settings cannot be modified without first disabling the NTP service.

Resolution

Refer to [Modify Reader NTP Settings through RShell Commands](#) for instructions how to disable the NTP service.

ItemSense fails to start job

ItemSense is unable to start a job, and displays the following message in the ItemSense GUI:



Error creating job
There was an error processing your request. It has been logged (ID 97f69738107aea52).

The problem may be insufficient disk space on the ItemSense server.

Resolution

1. Verify that there is enough disk space on the ItemSense Server. Refer to the ItemSense documentation for [resource requirements](#).
2. If ItemSense is running out of disk space, you may reclaim some space by [Pruning the Log files](#).
3. If jobs still do not start, contact Impinj Support.

ItemSense jobs prematurely stop running

If ItemSense jobs stop running before they reach the natural end of their life, the problem may be that there is not enough disk space on the ItemSense server.

Resolution

1. Verify that there is enough disk space on the ItemSense Server. Refer to the ItemSense documentation for [resource requirements](#).
2. If ItemSense is running out of disk space, you may reclaim some space by [Pruning the Log files](#).
3. If jobs still do not start, please contact Impinj Support.

Wrong Facility reported on Tag Reads

There may be several causes of this issue.

Resolution

1. Contact Impinj Support

Reader Provisioning fails

Networking issues may cause reader provisioning failures. Different ports are used when the reader is communicating back to ItemSense then when ItemSense is communicating to the reader. Although ItemSense may see the reader, the reader may not see ItemSense.

Resolution

1. [Verify network connectivity between the Readers and ItemSense](#)
2. If no networking issues were found, [re-provision the reader](#).
3. If no networking issues were found or you are still unable to provision the reader, contact Impinj support.

No tags show up in the Items Screen

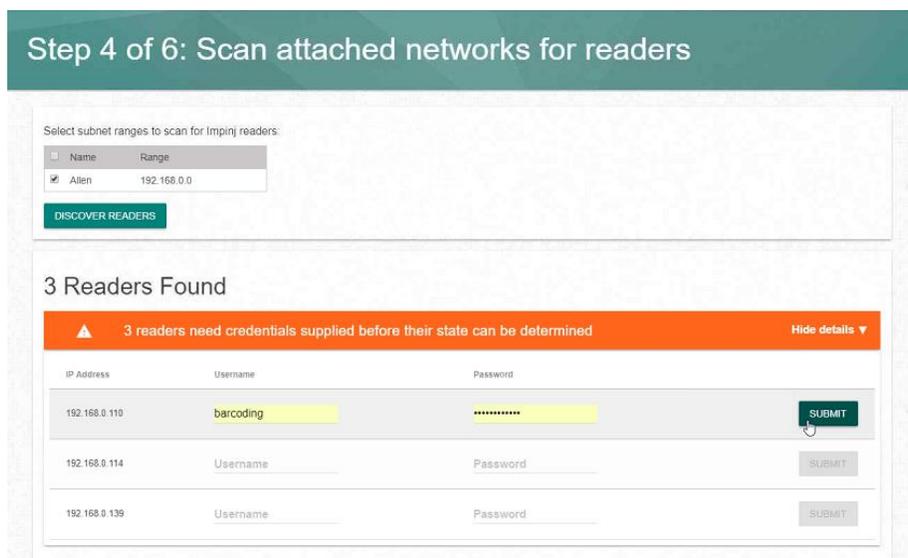
NTP time sync issues are the most common cause of tag read issues. However, it may also be caused by network issues, or a lack of sufficient disk space

Resolution

1. [Verify NTP Settings](#)
2. [Verify network connectivity between the Readers and ItemSense](#)
3. Verify that there is enough disk space on the ItemSense Server. Refer to the ItemSense documentation for [resource requirements](#).
4. If ItemSense is running out of disk space, you may reclaim some space by [Pruning the Log files](#).
5. If the problem persists, contact Impinj support.
6. Filter is enabled and preventing tags in the field of view being read.
7. One or more readers have rebooted.

Only One Reader may be Provisioned at a Time

If the password for the readers has been changed from the default 'impinj' password, the following error message may display when trying to provision more than one reader at a time:



The screenshot shows a web interface for provisioning readers. At the top, a green banner reads "Step 4 of 6: Scan attached networks for readers". Below this, there is a section titled "Select subnet ranges to scan for Impinj readers:" with a table containing one entry: "Allen" with range "192.168.0.0". A "DISCOVER READERS" button is below the table. The main section is titled "3 Readers Found" and contains an orange error banner: "3 readers need credentials supplied before their state can be determined". Below the banner is a table with columns for IP Address, Username, and Password. The first row shows IP "192.168.0.110", Username "barcoding", and Password "*****", with a "SUBMIT" button. The second and third rows show IP addresses "192.168.0.114" and "192.168.0.139" respectively, with empty Username and Password fields and "SUBMIT" buttons.

Resolution

Change passwords back to the default of “impinj” temporarily and then provision. Contact Impinj for scripts to help automate multiple reader updates.

Alternatively, just provision readers one at a time.

ItemSense operates slowly when reporting tags

When the readers are provisioned, the IP Address or Hostname used to access the IMC is written to the Reader as the ItemSense address. If this is an IP Address or Hostname that the reader has trouble connecting to, then the reader will have connectivity issues as it tries to communicate back to the IMC.

Resolution

1. When provisioning the readers, be sure to access the IMC using the same IP Address that the readers will be expected to use. This would be the IP address the readers use to communicate back to the IMC.
2. If the wrong address was used, you may have to [re-provision the reader](#) using the correct address.
3. If the issue persists, contact Impinj support.

RabbitMQ Message Queue Silently Dies after one hour

The RabbitMQ broker will quit after an hour of inactivity (no tag reads), and the connected app will not receive any notification that the connection is broken.

Resolution

This capability is by design. However, you may be able to setup Rabbit MQ to send out heartbeat frames.

Heartbeat frames are sent about every `timeout / 2` seconds. After two missed heartbeats, the peer is considered unreachable. Different clients manifest this differently but the TCP connection will be closed. When a client detects that RabbitMQ node is unreachable due to a heartbeat, it needs to re-connect^A.

NOTE: Please check the lib and version for any open bugs on this heartbeat capability.

Lost Admin Password

If ItemSense IMC password has been lost, it is possible to reset it back to its default value (admindefault)

Resolution

1. [Reset the Admin password](#) to its default value

ItemSense is stopped during a Job

If ItemSense is stopped while a job is running, it should be able to continue to receive data from the reader once it restarts. Data may be lost if reader's buffer fills before ItemSense is started.

Resolution

1. Restart ItemSense to reconnect to the job.
2. If ItemSense is unable to reconnect, it may be necessary to [Re-provision the Reader](#)

A Reader is stopped, or loses its network connection, during a Job

If the network is temporarily disconnected from a reader while it is running a job there will be no error message shown by ItemSense indicating that it has lost contact with the reader.

Resolution

1. Reconnect the reader, and the reads will successfully continue.
2. If the reader buffer did not overflow, no data should be lost.

CORRECTIVE PROCEDURES

Verify and Configure NTP Settings

For ItemSense to run correctly, all readers must have their clocks in sync with the ItemSense server they are registered with. The following issues may prevent this from happening:

- There is no Option 42 enabled on the DHCP server or ItemSense server has a different DHCP server than readers and using different NTP server.
- There is no internet access so there is no possibility of getting to an internet based NTP server, and there are no NTP servers configured on the network.

If any of these issues are present, ItemSense must be set up as an NTP server and configured as the reader's NTP server.

The following procedures describe how to do this:

1. Log into the ItemSense server, and open the NTP configuration file

```
sudo vi /etc/ntp.conf
```

2. Add as many NTP servers as possible. A minimum of 2 is recommended. Servers are listed from top to bottom in order of priority.

Example:

```
server 0.ubuntu.pool.ntp.org
server 1.ubuntu.pool.ntp.org
server 2.ubuntu.pool.ntp.org
server 3.ubuntu.pool.ntp.org

server ntp.ubuntu.com

server 127.127.1.0
```

NOTE: The last server address (127.127.1.0) is used if the other servers aren't available. It tells NTP to synchronize with itself. For an offline installation of ItemSense with no other NTP servers on the network, this is required.

3. Allow other machines to synchronize with this one by adding or removing restrictions.

```
restrict <network base address> mask <mask> <one or more flags>
```

Example:

```
restrict 10.200.35.0 mask 255.255.255.0 nomodify notrap
```

This will allow servers on that network to sync with this server but deny modification (via the protocol) of the NTP settings.

To read more about this see the man page for ntp.conf.

4. Save and exit the ntp.conf file.
5. (Optional) Prevent Ubuntu from requesting for NTP servers from DHCP. Edit the DHCP config file to remove the requesting of NTP servers via DHCP. This is done by removing "ntp-servers" from `request` command in the DHCP config file.

- Open the DHCP config file:

```
sudo vi /etc/dhcp/dhclient.conf
```

- Remove the ntp-servers parameter and its trailing comma:

```
request subnet-mask, broadcast-address, time-offset, routers, domain-name, domain-name-servers,
domain-search, host-name, dhcp6.name-servers, dhcp6.domain-search, netbios-name-servers, netbios-
scope, interface-mtu, rfc3442-classless-static-routes, ntp-servers, dhcp6.fqdn, dhcp6.sntp-
servers;
```

- Save and exit.
- Remove the generated NTP DHCP config file if it exists.

```
sudo rm /var/lib/ntp/ntp.conf.dhcp
```

6. Set NTP to be allowed in the Ubuntu firewall:

```
sudo ufw allow ntp
```

7. Restart the NTP service:

```
sudo service ntp restart
```

8. Verify ntpd comes back up:

```
sudo pgrep ntpd
```

- There should be a response of a process ID number.

9. Verify that ntp is working properly:

```
ntpq -pn
```

It should display the following information. If you are seeing 0.000 for delay, offset, and jitter, then NTP is not working for that server.

```
isadmin@is2017r1alpha:~$ ntpq -pn
      remote           refid      st t when poll reach   delay   offset  jitter
=====
 127.127.1.0      .LOCL.         5 l   -   64    0    0.000   0.000   0.000
 *129.6.15.30     .NIST.         1 u  126 1024  377   73.480   1.493   0.201
+192.154.108.74  216.218.254.202 2 u  222 1024  373   21.181   2.672   0.994
-5.20.0.20       193.219.61.110 2 u  792 1024  377  168.219   1.920   1.303
+204.11.201.12   216.218.254.202 2 u  339 1024  377   2.393   -2.424   1.096
-91.189.89.198   193.79.237.14  2 u   25 1024  377  131.697   0.081   0.210
isadmin@is2017r1alpha:~$
```

10. Log in to the reader rshell command prompt using SSH.

11. Disable ntp

```
config network ntp disable
```

12. (Optional) Modify the reader configuration to stop attempting to try and dynamically configure its NTP servers through DHCP.

```
config network ntp dynamicsservers disable
```

13. Delete any other configure NTP servers:

```
config network ntp delall
```

14. Add the ItemSense IP address as a statically configured NTP server:

```
config network ntp add <ItemSense IP>
```

15. Re-enable ntp

```
config network ntp enable
```

16. Check that the reader synchronizes (note: this can take a little while):

```
show network ntp
```

Verify network connectivity between the Reader and ItemSense

For information on which network ports are used by ItemSense and the Readers refer to the [ItemSense Network Requirements](#).

1. When provisioning the readers, be sure to access the IMC using the same IP Address that the readers will be expected to use. This will be the IP address the readers use to communicate back to the IMC.

2. Use ifconfig to determine what interface is being used for ethernet (e.g. eth1)
3. Use tcpdump on the ItemSense Server over port 443 to test for Reader to ItemSense connectivity issues:

```
tcpdump -i eth1 port 443 -w tcpdumpfile.443.pcap
```

4. While tcpdump is running, try to provision a reader.
5. When fails or completes, close tcpdump and load the resulting **pcap** file into your preferred network traffic analyzer (i.e. Wireshark).
6. If the readers are having problems connecting to ItemSense as their NTP server, use port 123 to test NTP traffic:

```
tcpdump -i eth1 port 123 -w tcpdumpfile.123.pcap
```

7. When fails or completes, close tcpdump and load the **pcap** file into your preferred network traffic analyzer (i.e. Wireshark).

ItemSense Log Pruning Procedures

ItemSense logs are contained within the home directory of the user who installed it. Each ItemSense service will have its own directory within the ItemSense parent directory. Generally, log files are only created when ItemSense is being used. In other words, if ItemSense isn't being used no logs will be created.

1. Log into the ItemSense server using the ItemSense installer's login with an SSH or FTP client.
2. Delete the largest logs from the 'general' ItemSense logs directory.

NOTE: ~/containers/itemsense/home/itemsense/var/output/logs

3. Delete the largest logs from the 'API Service' ItemSense logs directory.

NOTE: ~/containers/itemsense/home/itemsense/ItemSenseAPIService/var/output/logs

4. Delete the largest logs from the 'Coordinator' ItemSense logs directory.

NOTE: ~/containers/itemsense/home/itemsense/Coordinator/var/output/logs

Re-Provision Readers

Perform the following procedures when a reader needs to be provisioned:

1. Delete the reader configuration from the IMC if it exists.
2. Connect to the reader using SSH.
3. Remove the reader's CAP file

```
config image remove cap
```

4. Close the SSH client, and use the IMC to re-add the reader.

Reset the ItemSense IMC Admin password to its Default Value

1. Connect to ItemSense Server using SSH.
2. Edit the admin.json file

```
sudo vi ~/containers/itemsense/home/itemsense/data/configstore/users/admin.json
```

3. Replace the contents of the file with the following:

```
{"name": "Admin", "roles": ["Admin"], "visible": true, "passwordHash": "$2a$10$INiYM7LUIq1SDh90qSn6T.tEA1NpIs1/fXhUoOKrQaXGMBKvwlHnu"}
```

4. Reboot the ItemSense Server, and login into the IMC using 'admindefault' as the password.

EXTERNAL REFERENCES

^A Third Party Link: Detecting *Dead TCP Connections with Heartbeats* (<https://www.rabbitmq.com/heartbeats.html>) – Rabbit MQ’s instructions for using a heartbeat to detect dead TCP Connections

Developer Resources

ItemSense Installation Guide: <http://developer.impinj.com/itemsense/docs/impinj-itemsense-installation-guide>

ItemSense User Guide: <http://developer.impinj.com/itemsense/docs/user-guide>

ItemSense Management Console: <http://developer.impinj.com/itemsense/docs/working-with-impinj-itemsense-management-console>

GLOSSARY

- IMC: The IMC is the ItemSense Management Console, which is a browser based application hosted on port 3010 of the ItemSense server.
- NTP: NTP stands for Network Time Protocol, and it is an Internet protocol used to synchronize the clocks of computers to a time reference.

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