Overview
This guide is designed to help streamline the provisioning process when working with CDMA/EVDO based modules and devices from Janus Remote Communications. The topics discussed will be what steps to take prior to beginning the provisioning session, the session itself and what is needed for each service type, and debugging a failed session.

Provisioning is required for all CDMA/EVDO based modems, this is because they lack a SIM card that carries all the account information. Instead, they use an over the air update to put the account information directly into the modem’s memory for usage. This process only needs to happen on a couple of occurrences:

1. Brand new module, it has no account information at all.
2. The account information has been adjusted and must be updated

The steps do not need to be done on every boot up, as all the information is saved into NVM.

References:
Janus CF Plug-In User Manual — Download HERE
Janus T2 User Manual — Download HERE
Janus 400AP User Manual — Download HERE
Janus CDMA864D User Manual — Download HERE
Telit AT Command Guide — Download HERE
Verizon M2M Network Usage Guidelines — Contact Janus

Applicable Products:

Verizon Network:
CDMA864CF V3.00
CDMA864D V3.0
EVDO910CF V3.00
CDMA910CF V3.00
CDMA400AP V3.00
CDMA864T2 V3.0

Sprint Network:
CDMA864CF V2.00
CDMA864D V2.0
CDMA400AP V2.00
CDMA864T2 V2.0
Before You Begin:
1. Verify you are able to power up and communicate with the device, as the provisioning requires the usage of the AT Command interface. If not done yet, follow the unit’s getting started section in the respective user manual. These steps can be done over the UART or USB.
2. Contact Verizon, Sprint, or an MVNO to set-up a service contract.
   You will need to have the following information to set up service.
   1. Product Model Number.
      • Ex: CDMA864CF V3.00
   2. Product Manufacturer.
      • Janus Remote Communications
   3. The modem MEID# (given in hex).
      • Issue AT command AT#MEID?

Note 1: Please remember to let them know when setting the account that this is for M2M, not a normal cell phone. There are differences that their system must account for.

Note 2: If PPP connections are to be used with the modem, tethering may need to be added to the account options.

Note 3: After the account is set up for the modem and verified as active and ready, it’s recommended that you wait up to 24 hours before moving forward. Although the information has been entered, the network still needs time to set up to accept the new modem. If you attempt to move on and provision the modem, it may fail during the process. This will not harm or damage the modem in any way, but be aware that if the process fails this may be the only reason for it.

Note 4: Although the AT+CREG? proper response can be +CREG: 0,5 (roaming) during the provisioning process, the modem MUST be in a covered home network area. The modem can not properly provision when it is roaming. The exception is if the carrier has roaming agreements, but the rule of thumb is to simply be in the home network to avoid issues.

Steps to take for determining if you are unsure about being in the home network (Verizon Example):
If you are not sure if you are in a Verizon home network, you can check via the following:
   Enter AT#CAI?
Response will look similar to: #CAI: 20,1,4944,10,425,368,9,6,6,-87,-8,0,2,0,0,0,2,0,0,0,0
The first response is the SID, or system ID. This can be used in conjunction with a national lookup to see if you are in a Verizon home area.
   National Lookup: http://ifast.org/files/NationalSID.htm
An SID of 20 gives the following for example:
   Verizon Wireless (Chicago, IL; Gary-Hammond-East Chicago, IN; Kankakee, IL; Aurora-Elgin, IL; Joliet, IL; Indiana 1 - Newton)
Alternatively to AT#CAI, you can set AT+CREG=2 and it will respond with the registration response and the SID:
   Enter AT+CREG=2
   Response: OK
   Enter AT+CREG?
   Example Response: +CREG: 2,1,20
The Provisioning Process by Carrier

Sprint:
Activation on the Sprint network requires the module be powered up inside Sprint RF coverage. Powering up the module will trigger the network to provision all network information automatically into the module.

You can check the progress of the unit and ensure that the provisioning has completed by doing the following:

- Ensure the modem is registered to the network.
  Enter `AT+CREG?` and wait for response `+CREG: 0,1` or `+CREG: 0,5`
- Ensure Mobile IP is set.
  Enter `AT$QCMIP=2` and wait for response `OK`
- Verify the information by issuing `AT$QCMIPGETP`

The response will look similar to this:

- Profile:0 Enabled
- NAI:A1000009D010CA@hcm.sprintpcs.com
- Home Addr:0.0.0.0
- Primary HA:68.28.15.12
- Secondary HA:68.28.31.12
- MN-AAA SPI:1234
- MN-HA SPI:1234
- Rev Tun:1
- MN-AAA SS:Set
- MN-HA SS:Set

A modem that has not completed the provisioning process will have the following characteristics:

- Profile:0 Enabled
- NAI: YOUR_TERMINALS_MEID@hcm.sprintpcs.com

A modem that has successfully completed the provisioning process will have the following characteristics:

- Profile:1 Enabled
- NAI: ASSIGNED_PHONE_NUMBER@hcm.sprintpcs.com

Once the profile has been filled and the unit provisioned, a final step should be done to ensure the provider roaming list is up to date.

- Enter `AT+PRL=2`
- Response: OK

After the OK, you will want to look for the following:

- #905
- #909

These signify the PRL update has completed successfully.

#913 means the operation has failed somewhere. You can simply continue, but you may need to contact the provider if you find you are having issues with registration.

If you need to contact the provider, you can find the PRL version to reference with “AT$PRL?”.

After receiving OK, return the PRL to an automatic update mode.

- Enter `AT+PRL=1`
- Response: OK
The Provisioning Process by Carrier continued

Verizon:
The Verizon provisioning takes a more manual approach than Sprint, but still only requires a short operation to complete the process.

Ensure the module is registered on the network.
Enter AT+CREG?
Response: +CREG: 0,1 or +CREG:0,5

Ensure Mobile IP is set.
Enter AT$QCMIP=2 and wait for response OK

Verify profile 0 is selected and enabled. This is required for Verizon
Enter AT$QCMIPP?
Response: $QCMIPP: 0

Enter AT$ QCMIPEP?
Response $QCMIPEP: 1

Before going forward, check the profile information
Enter AT$QCMIPGETP
Response should be similar to below:
Profile:0 Enabled
NAI:0000009609@vzw3g.com
Home Addr:0.0.0.0
Primary HA:255.255.255.255
Secondary HA:255.255.255.255
MN-AAA SPI:2
MN-HA SPI:300
Rev Tun:1
MN-AAA SS:Unset
MN-HA SS:Unset

The NAI does not have the MDN yet, and the Shared Secret keys are not set. We see the profile 0 is selected, so now we move forward.
Enter ATD*22899; (semicolon included)
Response: OK

Wait for response #OTASP:0 (Start OTASP)
Wait for response #OTASP:1 (Start OTASP Commit)
Wait for response #OTASP:2 (End OTASP)

If you receive a response #OTASP:5 (SPC Unlock Attempt Fail), or do not receive #OTASP:1 and #OTASP:2, the provisioning has failed somewhere. Please verify that your account has been set up, activated, and that you have been given an MDN and MSID for your module’s MEID/ESN.

We can make sure the OTA information has been filled out now
Enter AT$QCMIPGETP
The Provisioning Process by Carrier continued

Verizon continued

Response should be similar to below:

- Profile:0 Enabled
- NAI:<MDN>@vzw3g.com
- Home Addr:0.0.0.0
- Primary HA:255.255.255.255
- Secondary HA:255.255.255.255
- MN-AAA SPI:2
- MN-HA SPI:300
- Rev Tun:1
- MN-AAA SS:Unset
- MN-HA SS:Unset

The keys are still not set, so we have one final step in which we open the PDP context for the first time to allow the network and modem to properly handshake and exchange keys.

Enter AT#SGACT=1,1
Wait for response: #SGACT:XXX.XXX.XXX.XXX

The response should be a valid IP address.

Wait 10-15 seconds and send command AT#SGACT=1,0. Wait for response OK.

Check the profile settings one last time

Enter AT$QCMIPGETP
Response should be similar to below:

- Profile:0 Enabled
- NAI:<MDN>@vzw3g.com
- Home Addr:0.0.0.0
- Primary HA:255.255.255.255
- Secondary HA:255.255.255.255
- MN-AAA SPI:2
- MN-HA SPI:300
- Rev Tun:1
- MN-AAA SS:Set
- MN-HA SS:Set

The keys are now set, so the provisioning was successful and the modem is ready to use on the Verizon network.

M2MAir Sprint

When using a Crossbridge account with Verizon, you can simply follow the Verizon steps to complete the process. However, for a Sprint account the following must be done.

When the account has been activated, you should receive information on the module, which includes the following:

- The module’s 10 digit MDN.
- The module’s 10 digit MSID.
- The module’s NAI, in a form similar to <MSID>@spp106.dl.sprintpcs.com.
- The password associated to the NAI <pw>.
- The Primary Home Address <pha>
- The Secondary Home Address <sha>
- The HA-SS
The Provisioning Process by Carrier continued

M2MAir Sprint continued

Ensure the module is registered on the network.

Enter AT+CREG?
Response: +CREG: 0,1 or +CREG:0,5

- Set the MDN and MSID values:
  Enter AT#ENG=9:<MDN>
  Response: OK.
  Enter AT#ENG=10<MSID>
  Response: OK.
  Enter AT#MODEM?
  Response: AT#MODEM: <mdn>, <msid>
  Verify the values have been set correctly.

- Select and disable NAI profile 0:
  Enter AT$QCMIPP=0
  Response: OK.
  Enter AT$QCMIPEP=0
  Response: OK.

- Select and enable NAI profile 1:
  Enter AT$QCMIPP=1
  Response: OK.
  Enter AT$QCMIPEP=1
  Response: OK.

- Enable mobile IP:
  Enter AT$QCMIP=2
  Response: OK.

- Enter NAI for profile 1:
  Enter AT$QCMIPNAI=<nai>,1
  Response: OK

- Enter Home Address:
  Enter AT$QCMIPHA=0.0.0.0,1
  Response: OK.

- Enter the Primary Home Address:
  Enter AT$QCMIPPHA=<pha>,1
  Response: OK

- Enter the Secondary Home Address:
  Enter AT$QCMIPSHA=<sha>,1
  Response: OK
The Provisioning Process by Carrier continued

M2MAir Sprint continued

Ensure the module is registered on the network continued

- Enter the AAA Server Security Parameter Index:
  Enter AT$QCMIPMASPI=1234,1
  Response: OK
- Enter the Home Agent Security Parameter Index:
  Enter AT$QCMIPMHSPI=1234,1
  Response: OK
- Enter the MN-AAA Shared Secret:
  Enter AT$QCMIPMASS=<pw>,1
  Response: OK
- Enter the MN_HA Shared Secret:
  Enter AT$QCMIPMHSS=oursecretmnhakey,1
  Response: OK
- Enable Reverse Tunneling:
  Enter AT$QCMIPRT=1,1
  Response: OK

Display the current NAI profile 1 settings and verify all values are correct:

Enter AT$QCMIPGETP

Response should be similar to below:

Profile:1 Enabled NAI: <MSID>@spp106.dl.sprintpcs.com
Home Addr:0.0.0.0
Primary HA:<pha>
Secondary HA:<sha>
MN-AAA SPI:1234
MN-HA SPI:1234
Rev Tun:1
MN-AAA SS:Set
MN-HA SS:Set

Passwords will not be displayed, but if a value has been entered and saved it will be displayed as “Set.” If you see them displayed as “Unset” go back and enter the value again.

Once the profile has been filled and the unit provisioned, a final step should be done to ensure the provider roaming list is up to date.

Enter AT+PRL=2
Response: OK
After receiving OK, return the PRL to an automatic update mode.

Enter AT+PRL=1
Response: OK

- Perform a reset:
  Enter AT$SPRESET
  Response: OK

The module will be operational again in approximately 10 seconds.
The Provisioning Process by Carrier continued

Aeris

Activation on the Aeris network requires the input of the MIN (equivalent to the MDN) into both NAMs of the module via AT commands, followed by a reset.

When the account has been activated, you should receive information on the module, which includes the following:
  - The module’s 10 digit MDN.

Ensure the module is registered on the network.
  - Enter AT+CREG?
  - Response: +CREG: 0,1 or +CREG:0,5

- Begin the process by writing the MIN value to both NAMs
  - Enter AT#CURRNAM=1<cr>
  - Response: OK
  - Enter AT$MDN=<mdn><cr>
  - Response: OK

  - Enter AT#CURRNAM=0<cr>
  - Response: OK
  - Enter AT$MDN=<mdn><cr>
  - Response: OK

- Perform a reset:
  - Enter AT$SPRESET
  - Response: OK

The module will be operational again in approximately 10 seconds.

Troubleshooting

If the provisioning process fails, there are a few common points that should be reviewed.

1. Make sure that the process has been followed exactly, with the correct profiles being selected. A common error is the wrong profile is set before moving forward.

2. Verify with the provider that the account that set up correctly for that modem’s MEID, that the account is active, that it’s been set for M2M, and that the profile has the correct technology type selected (1xRTT or EVDO).