Introduction

This document outlines how you acquire an operational point–to–point wireless link. This document contains the necessary components and commands to establish a link, and explains the commands and their use. For further information, refer to the Cisco Broadband Fixed Wireless Site Planning Guide.

Prerequisites

Requirements

Before you configure a wireless modem card, you must have this information:

- Number of antennas
- End of the communication link to be designated as "master"
- Transmit and receive frequencies
- IP address and subnet mask of the wireless modem card
- Transmit power
- Intermediate frequency (IF) cable loss between the wireless modem card and each wireless transverter (including loss in the power feed panel)

Components Used

The information in this document is based on these software and hardware versions:

- Cisco uBR7200 Series Universal Broadband Router
- Wireless Modem Card
The information in this document was created from the devices in a specific lab environment. All the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

**Conventions**

For more information on document conventions, refer to the Cisco Technical Tips Conventions.

**Configure**

In this section, you are presented with the information to configure the features described in this document.

*Note:* To find additional information on the commands used in this document, use the Command Lookup Tool (registered customers only).

**Network Diagram**

This document uses this network setup:

![Network Diagram](image)

**Configurations**

This document uses these configurations:

- Router 1
- Router 2

```
Router 1
interface Radio3/0
ip address 10.1.1.1 255.255.255.0
```
radio master
keepalive 10
radio receive-antennas 1
radio operating-band tx 5736.00 rx 5790.00

!--- If you cut and paste this code, be sure to check and correct the tx and rx frequencies.
!
radio channel-setup bandwidth 6.0 throughput high
radio transmit-power 16
radio cable-loss 1 6

!--- The space between the 1 and the 6 in the line above is necessary.
!--- It means that IF cable loss is 6 dB for antenna (transverter) 1.
!

<table>
<thead>
<tr>
<th>Router 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>interface Radio3/0</td>
</tr>
<tr>
<td>ip address 10.1.1.2 255.255.255.0</td>
</tr>
<tr>
<td>keepalive 10</td>
</tr>
<tr>
<td>radio receive-antennas 1</td>
</tr>
<tr>
<td>radio operating-band tx 5790.00 rx 5736.00</td>
</tr>
<tr>
<td>radio channel-setup bandwidth 6.0 throughput high</td>
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<td>radio transmit-power 16</td>
</tr>
<tr>
<td>radio cable-loss 1 6</td>
</tr>
</tbody>
</table>

Verify

There is currently no verification procedure available for this configuration.

Troubleshoot

There is currently no specific troubleshooting information available for this configuration.

Command Reference

Startup Commands

Use these commands to determine the status of the current configuration and to activate and deactivate a link.

- `show interfaces radio thresholds` Displays the set of currently configured thresholds of the modem card on the specified digital signal processors (DSPs).
- `show running-configuration` Displays the configuration information currently in use on the router, the configuration for a specific interface, or map class information.
- `show startup-configuration` Displays the contents of NVRAM, or shows the configuration file where the CONFIG_FILE environment variable points.
- `shut, no shut` Shuts down or reactivates a radio link.
- `write` When used in privileged EXEC mode, writes the configuration that is currently executed.

Installation and Configuration Commands

Use these commands to set parameters and enter information related to the broadband fixed wireless system.

- `loopback`
The **IF loopback** command tests the wireless line card.

The **RF loopback** command tests everything up to and including the transverter. It does not, however, test whether the duplexer is defective, installed incorrectly, or intended for the wrong band plan.

- **radio self−test** When you enable this command, a self−test runs every time the interface shuts down and comes back up.
- **radio receive−antennas** Allows configuration for one or two antennas. (To provide diversity, two antennas are necessary.)
- **radio master** Enables an interface to be the master, and thus provide the clock synchronization. You should only configure one end of the link to be the master.
- **radio channel−setup** Configures the bandwidth and throughput of the link.
- **radio operating−band** Allows configuration of the Tx and Rx frequencies of the link.
- **radio cable−loss** Configures the IF cable loss of the link.

**Note:** This is not the loss of the cable between the transverter and the antenna.

- **radio antenna−alignment** Enables the antenna alignment port on the outdoor unit (ODU) so that you can take a voltage measurement during the antenna alignment process.
- **radio transmit−power** Allows configuration of the appropriate transmit power for the link.

- The transmit power range for Multichannel Multipoint Distribution Service (MMDS) is between 14 and 33 decibels per milliwatt (dBm).
- The transmit power range for Unlicensed National Information Infrastructure (U−NII) is between 4 and 24 dBm.

### Operation Commands

Use these commands during normal operation to configure baseline encryption, duplexer characteristics, LEDs, and Automatic Response Query (ARQ) settings.

- **radio privacy** Deals with available encryption options.
- **radio duplexor** Only for use if the duplexer is replaced.

**Note:** This command does not command anything; it is used only to label the current configuration with the correct information about the presently installed duplexer.

- **radio led** Configures and shows status of LED color designations.

**Note:** If you change these settings from the defaults, error conditions may not be recognized.

- **radio arq** Allows configuration of ARQ parameters.
- **show interfaces radio arq** Shows what ARQ parameters are currently set.

### Monitoring Commands

Use these commands during operation to monitor the actions of the system and set measurements of system statistics.

- **radio metrics−threshold** commands These commands configure thresholds to measure the performance of the radio link over time. The thresholds for the radio link determine when a second is classified as:

  - Errored Second
  - Degraded Second
  - Severely Errored Second
  - Consecutive Severely Errored Second
• **radio threshold** Allows configuration of a threshold event specification.
• **show interfaces radio thresholds** Displays the set of currently configured thresholds on the modem card on the specified DSP.
• **show interfaces radio link–metrics** Displays the parameters measured during the operation of the radio link.

**Note:** This command definition is located in documentation on multipoint systems.

• **clear radio interface radio link–metrics** Clears link metrics settings.

**Troubleshooting Commands**

These commands provide troubleshooting information.

• **show controllers radio** Displays the parameters measured during the operation of the radio link.
• **radio histogram** Allows configuration of a histogram collection specification. Use these values to calculate signal–to–noise ration (SNR) and Rx signal level; refer to the formulas on the Wireless Point–to–Point Quick Reference Sheet for additional information.
• **radio byteErrorHist** Specifies the collection interval for the histogram for uncorrected codewords, as well as how often the collected histogram data is printed to the display screen.
• **show interfaces radio histspec** Displays the details of the histogram specifications currently configured.
• **show interfaces radio histdata** Displays the collected histogram data for the identified histogram specification.
• **debug radio** Displays debug messages for the radio link. One of the most useful debug commands is **debug radio log verbose**.

**Related Information**

• Wireless Point–to–Point Quick Reference Sheet
• Wireless Point–to–Point Frequently Asked Questions
• Wireless Point–to–Point Troubleshooting Guide
• Wireless Point–to–Point Troubleshooting FAQ and Checklist
• Wireless Point–to–Point Debug Outputs From Possible Physical Connection Problems
• Cisco uBR7200 Series Universal Broadband Router Wireless Modem Card and Subsystem Installation and Configuration
• Point–to–Point Wireless Support for the Cisco uBR7200 Series Universal Broadband Router
• Wireless Site Planning Considerations
• Wireless Installation Considerations
• Technical Support – Cisco Systems