

# Outdoor Bridge Range Calculation Utility

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## Introduction

This document explains how to use the Outdoor Bridge Range Calculation Utility to determine the range for the antenna.

## Prerequisites

### Requirements

There are no specific requirements for this document.

### Components Used

The information in this document is based on these Cisco Aironet 2.4 GHz and Cisco Aironet 5G Hz Outdoor Link models:

- BR340, BR350, BR500
- WGB340, WGB350
- PCI340, PCI350
- BR1410, BR1410–N
- BR1300

The information in this document was created from the devices in a specific lab environment. All of 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

Refer to Cisco Technical Tips Conventions for more information on document conventions.

## Background Information

The Cisco Outdoor Bridge Range Calculation Utility is the best tool to calculate the Fresnel zone, the distance between bridges, cable loss, required antenna height and the recommended fade margin. Cisco strongly advises you to use this utility as a part of the site survey to calculate the range parameters, before you deploy the bridges. This ensures higher throughput and consistent bridge performance.

The Outdoor Bridge Range Calculation Utility uses parameters that include regulatory domain, device type, data rate, antenna gain, and a few others as inputs.

You can avoid connectivity problems with the Outdoor Bridge Calculation Utility, as this tool helps you to predict the distance between devices. In a wireless environment without a tool like this, you cannot predict the distance between the bridges, the height at which you must place the antennas for maximum throughput, and other variables. This utility also helps you decide on the type of antenna that you must use in order to cover the distance between the bridges.

**Note:** The values that the tool provides are only theoretical. Use these values only as guidelines to deploy wireless bridges.

## Range Calculations

Complete these steps to use the Outdoor Bridge Range Calculation Utility:

**Note:** This calculation utility has been edited to stay within limitations for TX power and Effective Isotropic Radiated Power (EIRP) under the listed regulatory domains. There might be cases where it exceeds the limitations, and it is the responsibility of the installing parties to verify that the installation is within the laws of the location in which it is installed. The older 2.4 Ghz calculation utility has been retained and can be found at the last page of this spreadsheet.

1. Go to the **Outdoor Bridge Range Calculation Utility** tool.
2. . Select the proper Regulatory Domain based upon your approvals for installation locations. (see 2.4 GHz Regulatory Information or the 5 GHz Regulatory Information Worksheet).
3. Select the Product you use for both sides of the link.
4. Select the Datarate that is used.
5. Select the Power level for both sides of the link.
6. Select the Antenna you use on each site. If you use an antenna other than the Cisco Aironet antenna, specify the gain factor in dBi.
7. Select the Cables you use on each side. If you use a cable other than the Cisco Aironet cable, select **Other**, and type the loss per 100 feet and length of cable.

**Note:** These calculations are theoretical.

**Note:** Line of sight is required.

8. Select typical environmental conditions in order to match your local environment.

The worksheet displays the appropriate isotropic maximum distance in miles and kilometers, Earth Bulge at above distance, Fresnel Zone clearance for above distance, Required antenna height above obstructions, and Recommended Fade Margin (factor of distance)

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## Related Information

- **Troubleshooting Connectivity in a Wireless LAN Network**
  - **Cisco Aironet 1400 Series Bridge Software Configuration Guide, 12.2(15)JA**
  - **Cisco IOS Software Configuration Guide for Cisco Aironet 1300 Series Outdoor Access Point/Bridge 12.3(7)JA**
  - **Cisco Aironet 350 Series Tech Notes**
  - **Wireless Support Page**
  - **Technical Support & Documentation – Cisco Systems**
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