

# Recommended QoS Configuration Settings for TP-LINK Archer C3200 Wireless Router



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# Introduction

RingCentral has taken the guesswork out of router selection. Because we know that Quality of Service (QoS) is paramount to your business, we have carefully selected and tested a set of dependable routers suitable for supporting high-quality VoIP conversations.

This document provides recommended configuration settings to ensure the highest possible QoS for voice calls on the TP-LINK® Archer C3200 wireless router.

Additional routers that have been tested and recommended are shown on the [Recommended Routers](#) page of the RingCentral Customer Care website.

## Supported Browsers for Test

- Internet Explorer® 11 or higher (Windows® XP, 7, 8 or higher)
- Firefox® version 36 or higher (Windows and Mac®)
- Safari version 6.2 or higher (Mac)

### Note:

*The routers recommended here are quality hardware that we have tested internally and work reliably with our services. However, given the constantly updated firmware and physical changes made by manufacturers and the nature of cloud-based services, RingCentral cannot control the final configuration of the hardware or your computer systems/networks, or promise that any given router will work with your system, or guarantee that our information is 100% up to date.*

# Quality of Service

RingCentral provides reliable, high-quality voice service. Your local network, internet connection, and your router all contribute to overall call quality, with sufficient dedicated bandwidth to voice calls being the biggest factor. To help you manage your call quality, RingCentral offers tools to check your internet connection speed, and instructions to configure the Quality of Service (QoS) settings of your routers.

The QoS settings on your router enable it to give priority to real-time voice traffic over lower-priority data traffic, such as large downloads. This document provides recommended configuration settings to ensure the highest-possible QoS experience on the TP-LINK Archer C3200 router. Please reference the relevant TCP/UDP settings on the [Ports and Firewalls table](#) to complete the recommended setup.



# Test Your Connection Capacity

The RingCentral [Connection Capacity test](#) will help determine the maximum number of simultaneous RingCentral calls that can be supported on your broadband connection. Run this test during normal business hours when the connection is in use by other applications, including large file downloads.

The capacity test should be run using the maximum number of simultaneous call connections needed, and should use the G.711 codec selection.

### Specific requirements for QoS:

- Bandwidth—100 Kbps up and down per call
- Latency (one-way)—less than 150 ms
- Jitter—not to exceed 100 ms
- Packet loss—less than 3%

These requirements are the foundation for ensuring your local network can support satisfactory VoIP. Failure to meet these requirements will result in poor voice quality.

When the test completes, you will see the recommended number of simultaneous calls your connection can support while maintaining good quality voice calls.

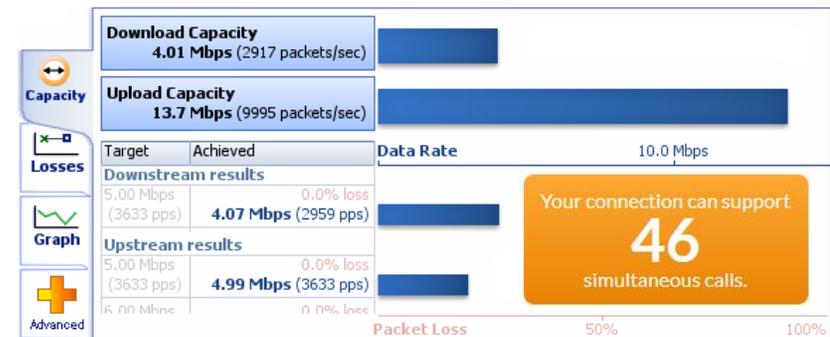
Start Test

⊖ **Advanced Options**

Download bandwidth starting point (Mbps): 5.0 v ?

Upload bandwidth starting point (Mbps): 5.0 v ?

Codec: G.711 (High) v



## Test Your Connection Quality

RingCentral provides a **VoIP Quality test** that will simulate VoIP calls between your computer and RingCentral, and provide an estimate of the voice quality you should expect when using our service. For the most accurate results, run this test *at least* three different times throughout a business day, and *during peak usage times*, while connected to the network that you plan to use for RingCentral.

A two-minute test is typically sufficient, while longer tests are useful to find intermittent problems or to simultaneously test VoIP performance along with other traffic, such as file transfers or remote access.

Select the maximum number of simultaneous users you expect to support, and set the test duration between 1 and 5 minutes; 2 minutes is considered sufficient in most instances.

Click [jitter](#) and [packet loss](#) on the **RESULTS SUMMARY** panel to view the overall quality of your expected VoIP connection.

**MOS score** (Mean Opinion Score) refers to a test that has been used for decades in telephony networks to obtain the human user's view of the quality of the network. The MOS is the arithmetic mean of all the individual scores, and can range from 1 (worst) to 5 (best). A MOS score of 4 is good.

Number of simultaneous calls:  ⓘ

**⊖ Advanced Options**

Test Duration (minutes):  ⓘ

Codect:  ⓘ

**Start Test**

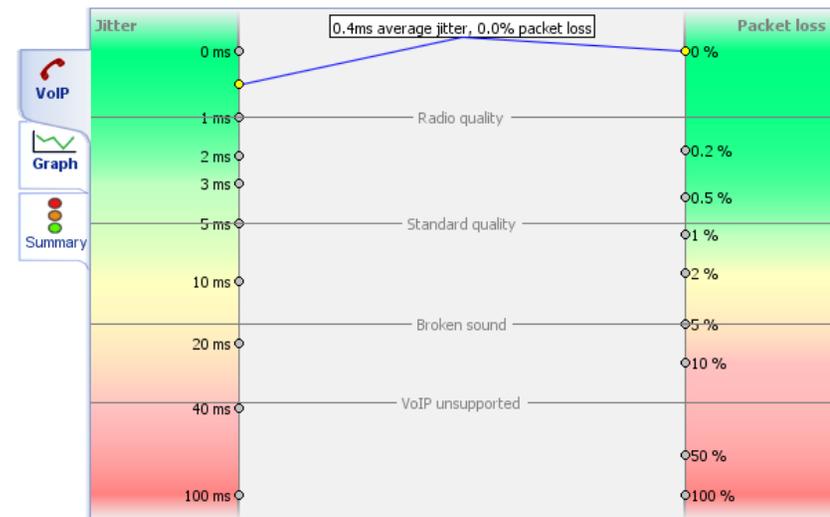
VoIP
Graph
Summary

### RESULTS SUMMARY

**Test audit report**

- Your connection's **jitter** was measured as 0.4 ms, which indicates that it can produce a constant flow of data. Voice-over-IP conversations should be of good quality.
- Your connection's **packet loss** was measured at 0.0%, which indicates that it is accurately transferring data. Voice-over-IP conversations should be of good quality.

Your connection's **MOS score** is estimated to be 4.2.



# Configure Your Router

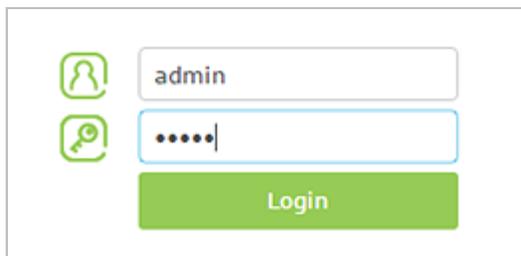
## TP-LINK Archer C3200 (AC3200) QoS Configuration



<b>Brand:</b>	TP-LINK
<b>Model:</b>	C3200
<b>Hardware version:</b>	Archer C3200 v1 00000000
<b>Firmware version:</b>	0.9.1 0.1 v004b.0 Build 160704 Rel.56586n

To review the User Guide for the TP-LINK Archer C3200 click [here](#).

1. Enter <http://192.168.0.1> in the address bar of a web browser. User name is **admin** and the default password is **admin**. Click **Login**.



2. Click **Advanced**; then **NAT Forwarding**. Select option **ALG**. Uncheck the option for **SIP ALG** and click the **Save** button.

The screenshot shows the TP-LINK Archer C3200 web interface. The top navigation bar includes 'Quick Setup', 'Basic', and 'Advanced' tabs, with 'Advanced' selected. On the right of the top bar are 'Logout' and 'Reboot' buttons. The left sidebar contains a menu with 'NAT Forwarding' (highlighted with a red box), 'ALG' (highlighted with a red box), 'Virtual Servers', 'Port Triggering', 'DMZ', 'UPnP', 'USB Settings', and 'Parental Controls'. The main content area is titled 'Application Layer Gateway (ALG)' and contains a list of settings:

PPTP Pass-through:	<input checked="" type="checkbox"/> Enable
L2TP Pass-through:	<input checked="" type="checkbox"/> Enable
IPSec Pass-through:	<input checked="" type="checkbox"/> Enable
FTP ALG:	<input checked="" type="checkbox"/> Enable
TFTP ALG:	<input checked="" type="checkbox"/> Enable
RTSP ALG:	<input checked="" type="checkbox"/> Enable
H323 ALG:	<input checked="" type="checkbox"/> Enable
SIP ALG:	<input type="checkbox"/> Enable

A red box highlights the 'SIP ALG' row. A green 'Save' button is located at the bottom right of the settings area.

- Click the **Bandwidth Control** tab; then **enable** the **Bandwidth Control** option. Set the Total Upstream Bandwidth and Total Downstream Bandwidth in kbps based on your measured internet speeds. This can be accomplished using your ISP's speed-test feature, via their website. *Example:* Search for (via Google) "Comcast speed test", or "AT&T speed test"; then click on the link to your ISP's website.

The screenshot displays the TP-LINK Archer C3200 web interface. The top navigation bar includes the TP-LINK logo, the model name 'Archer C3200', and tabs for 'Quick Setup', 'Basic', and 'Advanced'. On the right side of the top bar are 'Logout' and 'Reboot' buttons. A left sidebar contains a list of settings: 'Wireless', 'Guest Network', 'NAT Forwarding', 'USB Settings', 'Parental Controls', and 'Bandwidth Control'. The 'Bandwidth Control' option is highlighted with a red box. The main content area is titled 'Bandwidth Control' and features a 'Bandwidth Control' toggle switch set to 'Enable', which is also highlighted with a red box. Below this, there are two input fields: 'Total Upstream Bandwidth' and 'Total Downstream Bandwidth', both set to '10000 kbps'. A green 'Save' button is located at the bottom right of the settings area. Below the input fields is a section for 'Controlling Rules' with '+ Add' and '- Delete' buttons.

4. Under the same **Bandwidth Control** tab, you will need to prioritize your phones. To do this, click the **Add** button under **Controlling Rules**.
  - a. Under **IP Range**, enter the IP address range of the phones you wish to prioritize.  
You can set DHCP reservations to allocate a block of IP address specifically for the RingCentral phones for a specific range. This can be set up under **Advanced > DHCP Server > Address Reservations**.
  - b. Under **Port Range**, enter all ports used by **RingCentral services**. Default would be to cover them all using, 1000-65535.
  - c. Set **Protocol** to **All**.
  - d. Set **Priority** to **1**.
  - e. Set **Upstream & Downstream** values based on your networks usage of phones. Keep in mind an active phone call takes 100 kbps in both directions. **Note:** When you configure the IP address range, all phones in the range will share the allocated bandwidth.
  - f. Click **OK** to save the rule.

The screenshot shows the TP-LINK Archer C3200 web interface. The 'Advanced' tab is selected, and the 'Bandwidth Control' section is highlighted in the left sidebar. The 'Controlling Rules' section is active, showing a table with one rule. The rule is configured with the following values:

<input type="checkbox"/>	Description	Priority	Up(min/max)	Down(min/max)	Enable	Modify
<input type="checkbox"/>	--	--	--	--	--	--

The rule configuration details are as follows:

- IP Range:** 192.168.0.2 - 192.168.0.5
- Port Range:** 1000 - 65535
- Protocol:** ALL
- Priority:** 1 (1 means the highest priority.)
- Upstream:** 1000 to 5000
- Downstream:** 1000 to 5000

The 'Enable this entry' checkbox is checked. The 'Add' button is highlighted with a red box. The 'Cancel' and 'OK' buttons are visible at the bottom right.

# Ports and Firewalls Settings for RingCentral VoIP Service

Please see RingCentral [Ports and Firewalls](#) settings at the referenced link.