

# Google Meet 視訊會議頻寬需求之探究

## Study on bandwidth requirements of Google meet video conference

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### 摘要

視訊會議在網際網路發展已久，卻遲遲未能成為工作或學習環境中的必備要件，然而近期因為 COVID-19 疫情的影響，為有效控制疫情，視訊會議或遠距同步教學驟然成為工作或學習不可或缺的一環。然而，視訊會議或遠距同步學習，除了視訊會議平台本身的承載能量外，用戶端的網路環境，也是達成順暢進行視訊會議的重要條件。隨著視訊會議使用範圍的擴大與參與人數的增加，因為網路效能不佳或頻寬不足，因而造成視訊會議或遠距學習無法順暢進行的情況時有所聞。究竟在視訊會議進行時，實際會耗用多少網路頻寬，居家或工作場域的網路頻寬是否足以支撐同時多人視訊會議的進行，是本研究所欲探究的議題。研究結果顯示，當頻寬在 2Mbps 以上時，如果同時僅一人開啟音訊及視訊，同時進行簡報分享，音訊和視訊可以清晰傳送和接收，如此可以順利進行視訊會議；當頻寬在 512Kbps 左右時，如果僅一人開啟音訊，當可清晰傳遞聲音給其他與會者，但如果開啟視訊或者進行簡報分享，則視訊畫面的解析度會下降，且簡報內容會有延遲及解析度下降的情況，宜放慢簡報切換的速度，以期能順利進行視訊會議。

關鍵字：Google Meet、視訊會議、頻寬量測、頻寬需求

### Abstract

Video conferencing has been developing in the Internet for a long time, but it has not become a necessity in the work or learning environment. However, recently, due to the impact of COVID-19 epidemic, video conferencing or distance learning has suddenly become an indispensable part of work or learning in order to effectively control the epidemic. However, in addition to the capacity of the video conference platform itself, the network environment of the client is also an important condition for successful video conference. It is often heard that video conference or distance learning cannot be carried out smoothly because of insufficient bandwidth. How much network bandwidth will actually be consumed during video conference, and whether the network bandwidth in home or workplace is enough to support simultaneous video conferencing is the topic of this study. The results show that

when the bandwidth is more than 2Mbps, if only one person turns on audio and video, and shares screen at the same time, the video conference can be carried out smoothly; When the bandwidth is about 512Kbps, if only one person turns on the audio, the voice can be clearly transmitted to other participants. However, if the video is turned on or the screen is shared, the resolution of the video screen will decrease, and the briefing content will be delayed and the resolution will decrease. It is advisable to slow down the screen switching pace in order to smoothly carry out the video meeting..

Keywords: Google Meet, Video conferencing, Bandwidth measurement, Bandwidth requirement.