

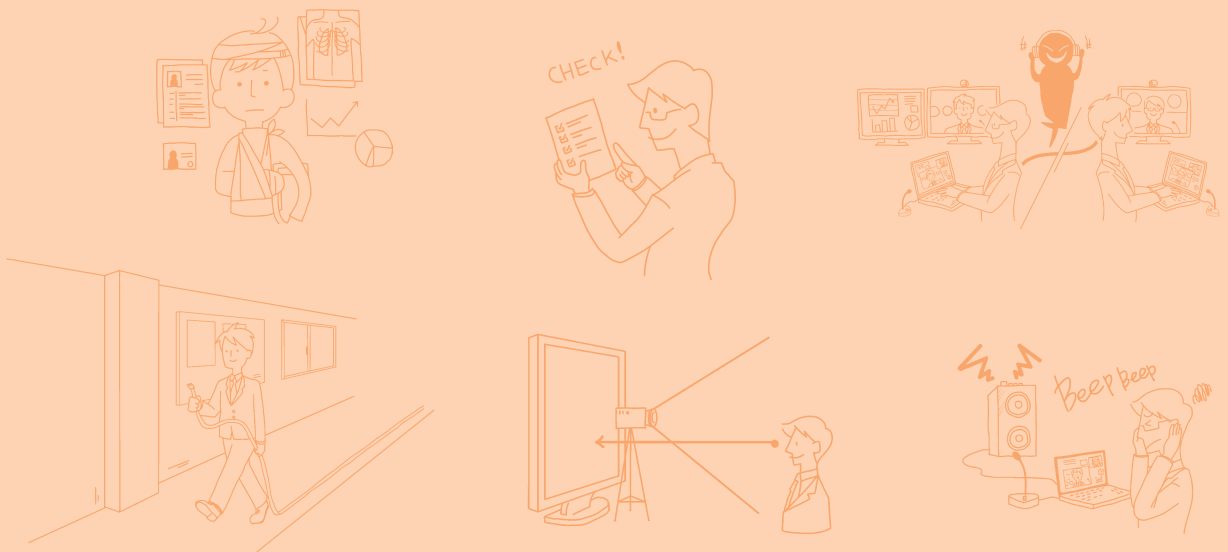
Telemedicine Conferencing

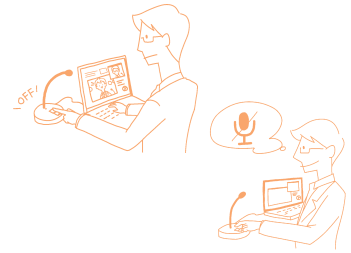
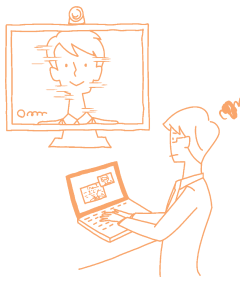
An Introductory Guide for Engineers

Supervisors: Shuji SHIMIZU, Naoki NAKASHIMA Editors: Kuriko KUDO, Yasuaki ANTOKU

Technology Team, Globalization Section, Standing Committee of the National University Hospital Council of Japan

Easy-to-follow guide with photographs and illustrations!





Telemedicine Conferencing

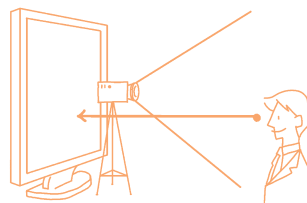
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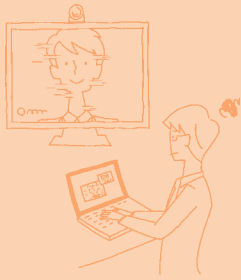
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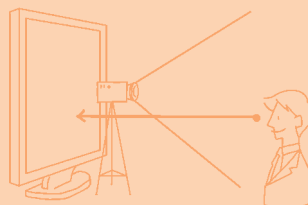
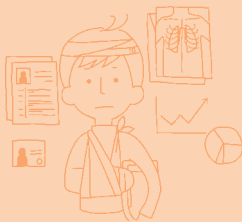
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Introduction

The spread of the internet around the world in recent years has increased telemedicine conferencing, as a means of sharing information among medical institutions in various formats, including visual, audio and presented materials. Teleconferencing reduces time and costs related to travel and enables people to access the latest information, including cutting-edge medicine from overseas and updates on emerging infectious diseases. It also encourages learning among medical staffs and contributes in enhancing English language skills, as needs for such skills continue to grow. At the same time, technical support of networks and audio-visual equipment is essential. However, many institutions are challenged with lack of qualified engineers and disparity of technical environments.

This guide is the achievement of one of the initiatives of the Globalization Project Team of the Standing Committee of the National University Hospital Council of Japan. It has been compiled with the support of engineers from national university hospitals that are participating actively in the project. The Globalization Project Team seeks to promote telemedicine conferencing, with the combined goal of creating international telemedicine networks and contributing to human resources development using ICT. In the course of our activities, we have found cases of doctors who wish to participate in teleconferencing but who do not have technical support in getting connected and also people without expert knowledge on becoming engineers. Telemedicine conference presents various issues such as; What preparations are needed? How should preparations be made? How should equipment be handled? What needs to be done if problems occur? This guide aims to provide an introduction to teleconferencing and give answers to these questions, using illustrations and tables to make processes easy to understand. All descriptions are simplified for the purpose of non-native English speaker. It is based on the assumption that users are participating to an externally hosted teleconference as one of the connecting institutions. The guide features key points according to their degree of difficulty, aimed at people who are tasked with organizing a telemedicine conference at a short notice. It also includes a checklist for different kinds of teleconferences, enabling users to acquire the information they need quickly.

We hope that this guide will help to further promote and spread telemedicine conferencing.

August 2017

Kuriko KUDO Shuji SHIMIZU

Editors and Authors

Supervisors		
Shuji SHIMIZU	Professor	Kyushu University Hospital
Naoki NAKASHIMA	Professor	Kyushu University Hospital
Editors		
Kuriko KUDO	Assistant Professor	Kyushu University Hospital
Yasuaki ANTOKU	Associate Professor	Oita University Hospital
Authors		
Mitsuhiro TAKASAKI	Associate Professor	Saga University
Masaru SANUKI	Assistant Professor	University of Tsukuba
Yoshinori YAMASHITA	Associate Professor	University of Fukui Hospital
Naoki NAKAMURA	Lecturer	Tohoku University Hospital
Daiki MIKAMI	Technical Staff	Asahikawa Medical University Hospital
Yasuaki ANTOKU	Associate Professor	Oita University Hospital
Kuriko KUDO	Assistant Professor	Kyushu University Hospital
Shunta TOMIMATSU	Technical Staff	Kyushu University Hospital
Yoshiko HOUKABE	Technical Staff	Kyushu University Hospital
Tohru KONDO	Associate Professor	Hiroshima University
Takashi KIMURA	Research Assistant Professor	Chiba University Hospital
Itsuko ASADA	Technical Staff	Nagoya University
Masayuki KOBAYASHI	Technical Assistance Staff	Nagoya University
Akira ENDOH	Associate Professor	Hokkaido University Hospital
Kazuhiro SUMIYOSHI	Technical Specialist	Hokkaido University Hospital
Reona UMEKI	Administrative Staff	Hokkaido University Hospital
Eiji YAMADA	Specially Appointed Technical Specialist	Osaka University Hospital
Kota TORIKAI	Associate Professor	Gunma University Hospital
Fuminori MURANAGA	Senior Assistant Professor	Kagoshima University Hospital
Ken-ichiro SHIMAI	Assistant Professor	Chiba University Hospital
Masato TAGI	Technical Staff	Tokushima University Hospital



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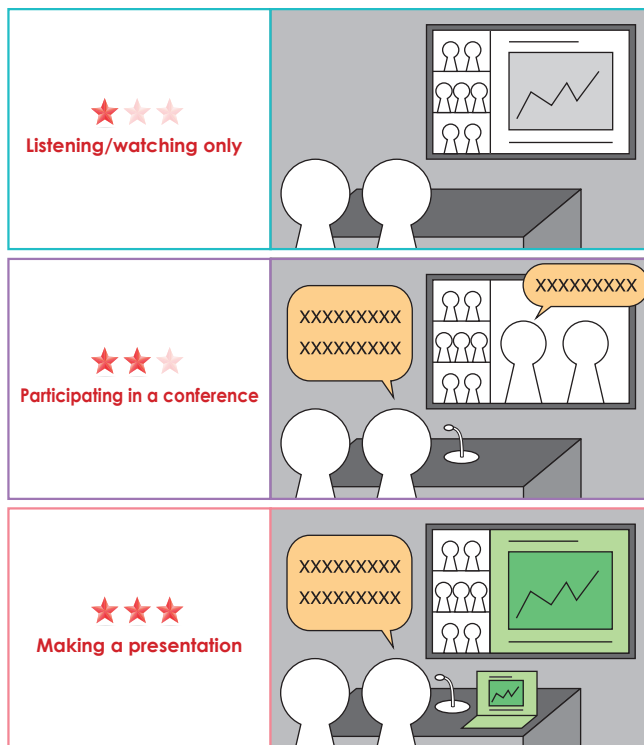
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About this Guide

● Target Users

This guide is based on the assumption that users are participating in an externally hosted teleconference as one of the connecting institutions and it targets the engineers of the institution that is connecting to the host conference. All descriptions are simplified for the purpose of non-native English speaker.

The guide anticipates three levels of participation in a telemedicine conference. They are as follows:



● Format of this Guide

This guide is structured into six chapters, including everything from advance preparations to troubleshooting during the teleconference. **Chapters 1 to 5** start with key points, followed by detailed contents. In the appendices at the end of the guide you will find useful information for responding to actual conferencing events. These include a “Flowchart for Determining Event Type,” “Checklist Depending on Event Type,” and “H.323 Teleconferencing System List.”

The way to use the guide is as follows.

● Points Detailed in Each Chapter

Key points are detailed at the beginning of **Chapters 1 to 5**. Check to see if any of the items described in the left-hand column apply to the level of your participation in a conference. If the left-hand items apply to you, then the checklist items marked with ✓ are particularly important.

KEY POINTS	Listening/ watching only	Participating in a conference	Making a presentation
	☆☆☆	☆☆☆	☆☆☆
Advance preparations for a local meeting/teleconference			
● For a teleconference, various technical preparations are needed in addition to the preparations for a local meeting.	✓	✓	✓
Flow for a local meeting			
● Decide followings; time/date → Venue, main theme or agenda → Program → Presenters → Start preparations	✓	✓	✓
Items to confirm with presenters			

● Flowchart for Determining Event Type and Requirements About the Checklist Depending on Event Type

In the Checklist Depending on Event Type located in the appendices at the end of this guide, you will find items that an engineer arranging a telemedicine conference needs to confirm prior to teleconference participation.

First, use the **Flowchart for Determining Event Type** to confirm which pattern number applies to the teleconference you are participating in. Next, go to the checklist for this pattern to confirm what needs to be done. If you need to confirm specific details, you will find a reference to the corresponding chapter.

● Glossary

Please use the glossary in the appendices if there are any terms that you are not familiar with.

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Chapter 1

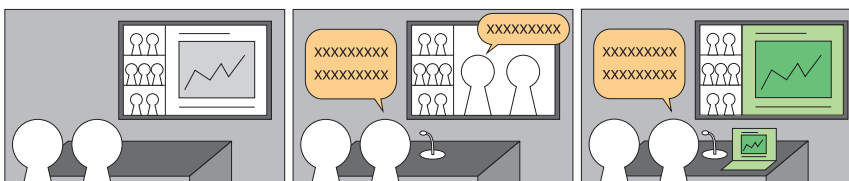
Advance Preparations

You are scheduled to participate in a telemedicine conference! Where should you start?

In this chapter, we explain what preparations are necessary for a telemedicine conference and how they differ from the requirements for a teleconference or local meeting.

KEY POINTS

	Listening/ watching only	Participating in a conference	Making a presentation
	★ ★ ★	★ ★ ★	★ ★ ★
Advance preparations for a local meeting/teleconference			
<ul style="list-style-type: none"> For a teleconference, various technical preparations are needed in addition to the preparations for a local meeting. 	✓	✓	✓
Flow for a local meeting			
<ul style="list-style-type: none"> Decide followings; time/date → Venue, main theme or agents → Program → Presenters → Start preparations 	✓	✓	✓
Items to confirm with presenters			
<ul style="list-style-type: none"> Types of PC applied 			✓
<ul style="list-style-type: none"> Format of presentation file 			✓
<ul style="list-style-type: none"> With or without multimedia (videos or sound, etc.) 			✓
Possible problems and advance solutions			
<ul style="list-style-type: none"> Hardware (equipment) problem → Have a backup ready 	✓	✓	✓
<ul style="list-style-type: none"> Network problem → Conduct an advance test and contact the network administrator in own venue ahead of time 	✓	✓	✓
<ul style="list-style-type: none"> Presentation problem → Share data in advance, reduce data size and check audio/visual components 			✓



★ ★ ★
Listening/watching only

★ ★ ★
Participating in a conference

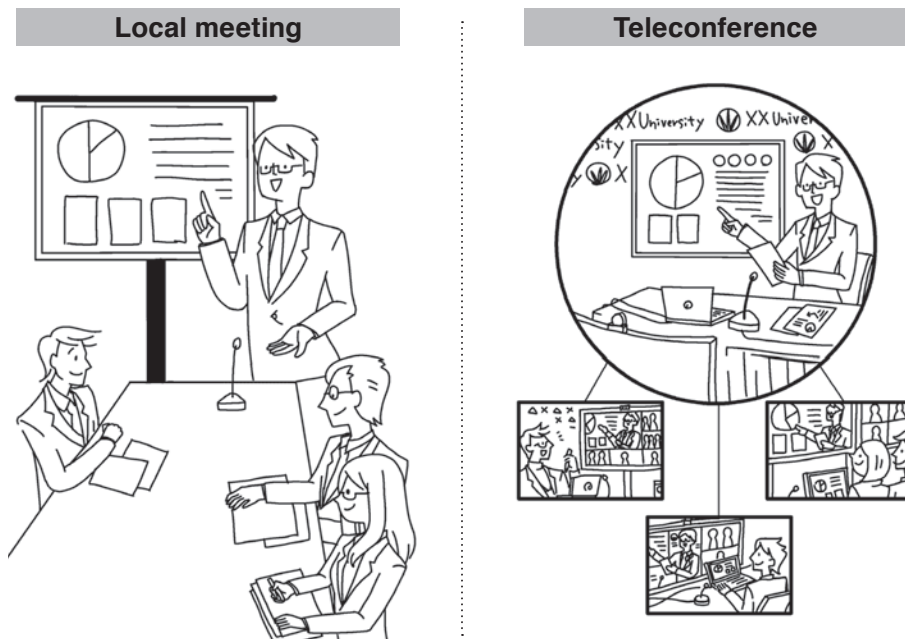
★ ★ ★
Making a presentation

1-1

Advance Preparations for a Local Meeting/ Teleconference

In this chapter, we explain what preparations are necessary for a telemedicine conference and how they differ from the requirements for a teleconference or local meeting. The difference between a local meeting and teleconference is as follows. Whereas all participants gather in the same venue for a local meeting, a teleconference is held by connecting audio and video among multiple venues.

Conference



The items to be prepared for a teleconference are shown in Figure. 1-1. They are ranked in order of technical difficulty from top to bottom, with the items increasing in complexity.

The items listed in the green circle are necessary for local meetings while the items in the pink circle are necessary for a teleconference. From Figure. 1-1 it can be seen that teleconference preparations involve all the preparations needed for a local meeting. You can also see that a teleconference includes many items that are not needed for a standard meeting and some of these are challenging technically. The items enclosed in the dashed red line are the responsibility of the engineers. As the engineers responsibility will vary according to the type, purpose and participation style of the teleconference, it is best to check with the teleconference host on which of these items you will need to prepare.

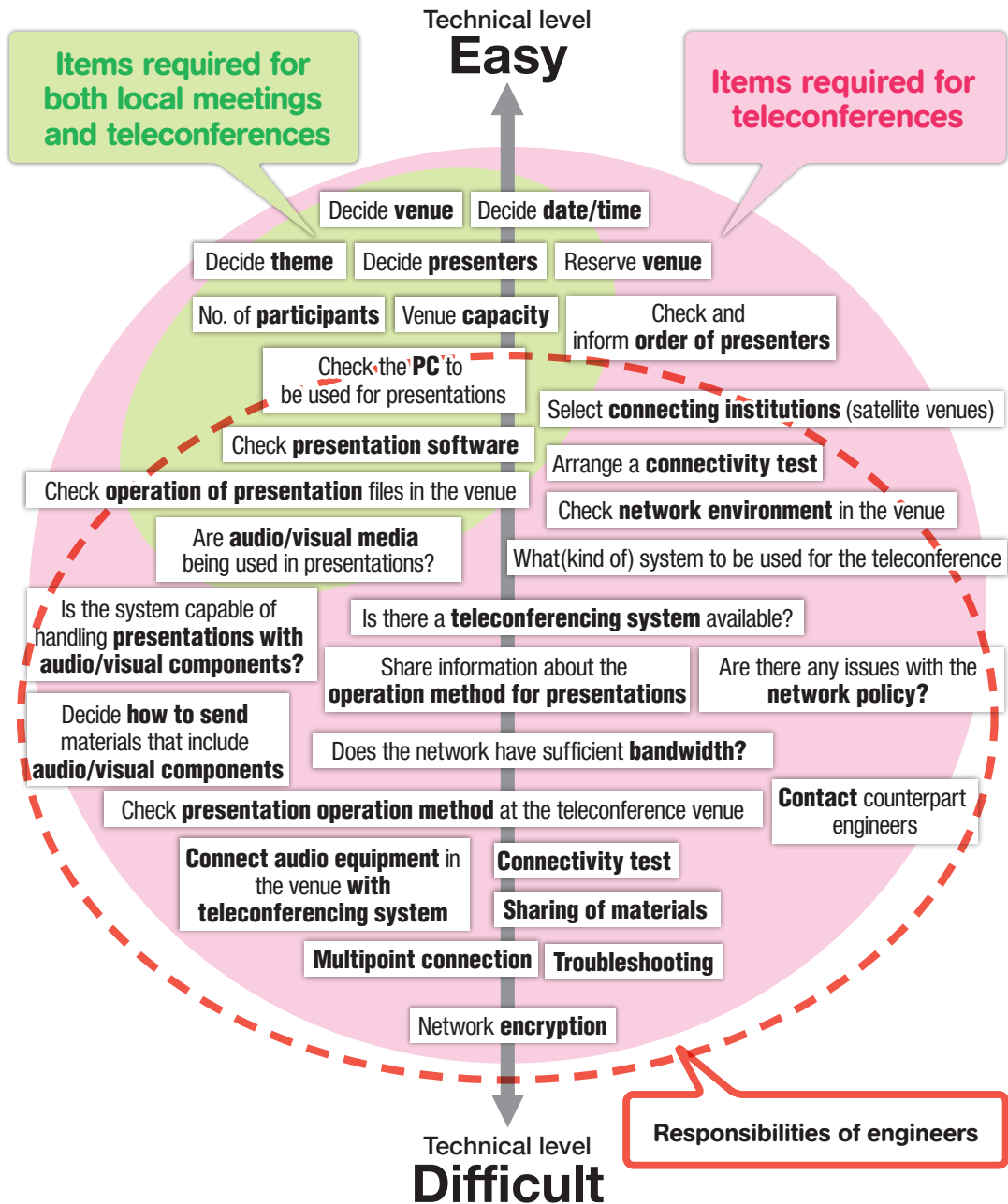


Figure. 1-1 Advance Preparations for a Local Meeting/Teleconference

1-2. Holding a Local Meeting

1-2-1. Flow for a local meeting

For a local meeting, once the preparations are planned, initial steps are as follows. These steps are also the same for a teleconference.

1. Decide date/time
2. Decide venue
3. Decide main theme
4. Decide program
5. Decide presenters
6. Proceed with preparations ahead of meeting



Of these points, **1.** and **2.** will be decided first. In most cases a list of possible dates will be sent out and the venue and date will be decided after checking the availability of the planned venue.

It is essential that we pay attention to the security update of the PC. By security updating, the network traffic is growth, then the transmission will unstable. Also, the computer resource is required during updating, its PC will be unstable.

In many cases **3.**, **4.** and **5.**, will be decided almost in parallel and this process will be led by experts participating in the teleconference (medical staffs). Once these are decided preparations for the meeting will proceed.

1-2-2. Matters to be checked and coordination with presenters

For both local meetings and teleconferences, if presentations are to be made at the venue it will be necessary to check the following points with the presenters.

- Will the presenter use his/her own PC for presenting or a PC provided by the Engineer?
- If using presenter's own PC, what type is it and what type/version of OS does it run on?
- Are there any special preparations needed to display materials(slides)? (Will standard presentation software like PowerPoint be sufficient? Are there any special software requirements?)

-
- Does the presentation include multimedia (audio or visual components, etc.)? If it does, the engineer and presenter will need to consider the file format and output method.
 - If there are multiple presenters, please request the conference chairperson/moderator to coordinate the time allotted for presentations, the order of presentations and how to proceed with general discussion, etc.
-

1-2-3. Points to note when preparing presentations

In medical conferences, it is often the case that presentations include medical data. When these data are used in a conference environment, it is important to consider the following points. It is also necessary to make the presenters aware of these points below.

-
- Increase the font size.
 - Use high resolution images/videos and check their operability on the PC that will be used in the teleconference.
 - Erase information that makes it possible to specify individual patients (anonymization or masking, etc.)
-

1-3. Advance Preparations for a Teleconference

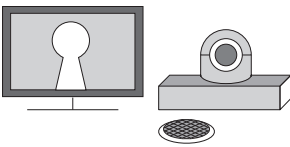
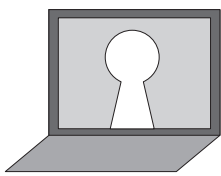
All of the points mentioned in the sections above are also required for a teleconference and are of the same level of importance as for a standard meeting. In the case of a teleconference, the additional items that need advance preparation are listed below.

- Preparing teleconferencing system environment
- Making people fully aware of the operation methods for the teleconferencing system
- Checking the network environment in each venue
- Checking audio equipment in each venue
- Checking response in case of system failure

1-3-1. Preparing teleconferencing system environment

Teleconferencing systems can be roughly classified into two categories, one that is comprised of dedicated equipment and the other that is run on installed PC software. The former is known as a hardware-based system and the latter is called a software-based system. In the case of a hardware-based system, it will also be necessary to install a certain PC software. At the preparation stage it is essential to correctly adjust the usage environment for the teleconferencing system and check if it works properly. Further details about teleconferencing systems are provided in **Chapter 3**.

For both hardware and software-based systems, it is necessary to ensure that you are using the latest version available, so it is essential to make sure that all security updates, etc., have been installed. In the case of software-based systems, in particular, it is usually necessary to reboot your PC after having installed update files, so if you had to do this during a teleconference there is a possibility that your conference would be cut off.

	Hardware-based system	Software-based system
Image		
Characteristics	<ul style="list-style-type: none"> • Dedicated equipment is required • Relatively expensive • Image and sound quality are high and problems are relatively few • After configure, easy to operate 	<ul style="list-style-type: none"> • Operated by software • Client-use software is cheap (or free) • Quick and easy setup • Image quality is easily affected by PC performance

1-3-2. Communicate presenters about operation methods of teleconferencing system

In case presentation is send from your own venue, it is likely that the presenter will need to operate the system him/herself. It is therefore essential to explain the operation method in advance so that the presenter has the skills needed. Particularly when using a software-based teleconferencing system, it is important to remember that even a simple operation such as moving to the next slide may differ from system to system. Therefore it is not enough to have a rehearsal that simply puts the presentation on screen without showing the presenter how the system works. This could lead to a situation in the conference itself where the presenter does not know how to move to the next slide.

1-3-3. Checking the network environment in each venue

It is essential to check the network environment for any teleconferences. A poor network connection makes teleconferencing impossible. Careful attention needs to be paid to checking the network environment in all participating venues. As a rule, testing of network connectivity must be completed each time of teleconference regardless of past successful implementations or failed experiences due to network circumstances and due to connectability or specifications of it may change according to venues or locations.

Network confirmation should also be done on the day of the teleconference, connecting with the network you will be using. Even in cases where you cannot make preparations in the venue itself until immediately before the conference starts and you therefore have to do a connectivity test in a nearby room, you should confirm the network configuration in the actual venue and perform network environment checks as close as possible to the venue itself. For hospital networks in particular there are cases in which it is not possible to connect or communicate due to network security policies, so it is necessary to do a connectivity test from the actual venue for the conference. Problems where only audio or only images can be seen or heard can also be due to network issues, so it is also a good idea to make a simple presentation (using sound and images) when doing the connectivity test.

Further details about networks are provided in **Chapter 2**.



1-3-4. Checking audio equipment in each venue

For a teleconference, people tend to focus on ensuring that the presented materials are displayed properly at all participating venues. On the other hand, sound is overlooked in many cases, so that

it is taken for granted that people will be able to hear each other. However, smooth transmission of sound through teleconferencing systems requires technical attention. Especially, it is not easy to realize smooth discussion among multiple venues through the internet.

One major issue is microphone echo. An echo is created when the sound from the audio output is picked up after a short period by the conferencing system's audio input. One of the critical skills for an engineer in a teleconference is to facilitate discussion by removing echo. If echo is not properly removed not only will the presenter be able to hear his/her own voice being repeated, but harsh and loud howling can also occur, which would have the devastating effect of bringing all discussions to a halt.

Further details about sound equipment and about venue setup are provided in **Chapter 3-1-2** and **Chapter 4-3**, respectively.

1-3-5. Confirming response when trouble occurs

As teleconferences take place at multiple venues, the potential for trouble also increases in comparison with a local meeting. For example, when operating in five venues instead of one, the probability of a projector problem occurring increases by five times, regardless of any other issues. Furthermore, as a network connection is essential for a teleconference, there is also a possibility that connectivity problems may arise. It is important to always bear in mind that there is greater potential for problems in a teleconference than in a local meeting.

In terms of potential trouble, there are a variety of scenarios that could occur. These include hardware issues such as cable disconnection or switch/hub problems, or data flows exceeding network capacity and making it impossible to see or hear, and also instability in the operation of the teleconferencing system for whatever reason, which causes images and sound to be cut off.

If these kinds of problems occur and you still have a network connection, one possible solution is to prepare a backup environment that will enable “receiving streaming” (a situation where participants at the venue with the problem are not able to make comments, but can still hear the discussion in other venues).

Also, if you plan to make a presentation from your own venue, it is important to check the file



size of the presentation materials beforehand and remake any files that are too large to make them a smaller, more manageable in size. Another solution to reduce the risk of problems is to consult with the conference host in advance and share files with all venues, so that even if the system becomes unstable it is still possible for the presentation materials to be shown in all venues.

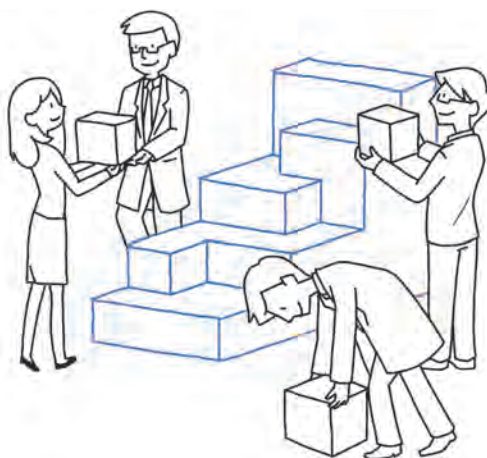
Important points to consider during the teleconference itself are detailed in **Chapter 5** and **Chapter 6** covers advice on troubleshooting.

Possible problems and advance solutions

Type	Anticipated trouble	Advance preparations
Equipment	Anticipated trouble	Unstable
	Advance preparations	System/security update in advance
Network	Poor/Unstable connection	Conduct advance tests and contact the conference host in advance Prepare streaming environment as a backup
Presentations	Cannot be displayed	Share files in advance in all venues, compress files where necessary
	No sound	Conduct advance test and ensure there is no echo

As has been explained in this chapter, implementing a teleconference requires various preparations specific to remote participation via a network, in addition to the preparations for a local meeting. These requirements may be fully understood by people who have experienced teleconferences on numerous occasions, but for people who are new to teleconferencing there are items that may be difficult to anticipate.

In both a local meeting and a teleconference, the key to success depends on the degree to which participants can acquire knowledge and information. In order to achieve a telemedicine conference that enables participants at different venues to talk with each other and deepen their knowledge, it is important to have good communication channels among engineers and other support staff at all participating venues from the planning stages through to the conference itself and also to identify any issues for improvement after the conference has concluded. In most cases the organizers of a conference (specialists such as doctors, nurses, etc.) may be unaware of the differences or similarities between a teleconference and a local meeting. It is therefore necessary to have someone in place who will act as a coordinator between the conference organizers and engineers.



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2

Networks

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Chapter 2 Networks

A network is essential for any telemedicine conference, a vital piece of infrastructure for connecting teleconferencing systems. Without all network requirements being fulfilled, your ability to actually conduct a teleconference and also the quality of the conference itself could be significantly affected. As network operation policies differ from institution to institution, it is necessary to ensure compatibility between networks. Technical knowledge is also needed and you may find it a challenge when setting up equipment and connections for the first time, as the processes are different to simply connecting a PC.

In this chapter, we explain how to prepare network infrastructure and put all the necessary elements in place to run a successful telemedicine conference.

KEY POINTS

	Listening/ watching only	Participating in a conference	Making a presentation
	★ ★ ★	★ ★ ★	★ ★ ★
Network requirements			
● Real time		✓	✓
● Stability (bandwidth, wired connections)	✓	✓	✓
● Access to internet, etc.	✓	✓	✓
● Can existing networks be used or is a new network required?	✓	✓	✓
● Do you have a Global/Public IP address reachable from overseas?		✓	✓
● Is it possible to ensure security?	✓	✓	✓
● Internet connection contract, provider contract	✓	✓	✓
Recommended bandwidth requirements for various systems			
● Vidyo streaming only – Download 1Mbps	✓	✓	✓
● Use of Vidyo – Up/Download 1Mbps		✓	✓
● Use of H.323 – Up/Download 2Mbps		✓	✓
● Use of DVTS – Up/Download 30Mbps		✓	✓

	Listening/ watching only	Participating in a conference	Making a presentation
	★ ★ ★	★ ★ ★	★ ★ ★
Points requiring special attention			
● Consideration of internal and external quality of service (QoS) if sufficient bandwidth is not available	✓	✓	✓
● Personal and private information	✓	✓	✓
● Equipment software updates and anti-virus measures	✓	✓	✓



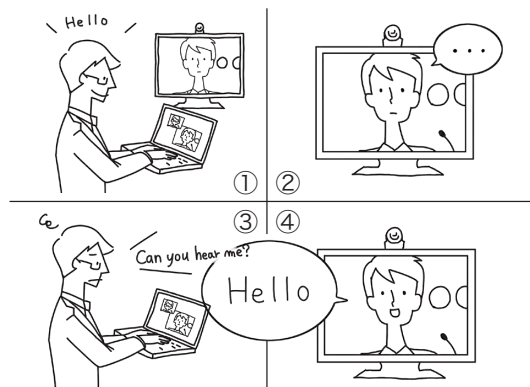
2-1 Network Requirements for Telemedicine Conferencing

Telemedicine conferencing has special communication requirements and it is necessary to ensure that you have prepared your own network to meet these requirements.

1 Real time

In contrast to downloading a file, a teleconference is for interactive communication purposes. Therefore it is necessary to ensure that you are able to send image and voice data instantaneously to your conference counterparts and simultaneously receive data from them.

Any delay in sending or receiving data will cause conference failure.



② Stability

Stable transmission is essential to ensure continuous communication for the duration of the conference. Connectivity may fluctuate in speed and susceptibility, from poor at night but better in the morning, depending on the time of the day. If transmission is temporarily cut off during a conference or if image and voice quality suddenly deteriorates, this will significantly impact smooth communication.



③ Reachability

It is essential to communicate adequately using image and voice data via an IP network even when communicating with geographically distant institutions. In these situations, it is generally the case that a Global/Public IP network via the internet will be used to connect distant conferencing counterparts.



By connecting to a public network, it is possible to communicate not just with a limited number of institutions, but to get in touch with anywhere around the world.

④ Security

The contents of a telemedicine conference may require special confidentiality measures. There is also a danger that conference content could be intercepted by a malicious third party. It is therefore necessary to consider security measures and ways to protect data flows during the conference.



2-2. Preparing the Network Environment

In this chapter, we explain specific details that need to be checked and considered when preparing a network environment. The specialist and technical network elements detailed below are further explained in **Chapter 2-3**.

2-2-1. Checking the current network environment at your institution

When making network preparations, it is necessary to check the current status of the network in the venue you will be using. You should always check with the people responsible for administrating the network environment at your facility (including electricians, facility managers and administrative

managers). If the existing network is not fast enough or if there is no network in place, or if you are having trouble gaining information from the administrators described above, it will be necessary to establish a new network contracting with a communications carrier.

From **Chapter 2-2-3** onwards you will find explanations about two scenarios; one that explains about what to do when an existing network is in place and another that details how to go about constructing a new network if none is available.

2-2-2. Commercial networks and Government/Academic Education Networks

The world of the internet consists of commercial networks and Government/Academic Education Networks. Commercial networks are laid by communications carriers. In contrast, Government/Academic Education Networks are established by national governments or academic organizations for the purpose of promoting the spread of the Internet. Both networks share mutual connectivity and form a general-purpose public network.

Commercial networks are shared by multiple communications carriers. This can make it difficult to secure sufficient network bandwidth among all carriers or control QoS through routing control, etc. Government/Academic Education Networks, on the other hand, are managed by academic and research institutions and the network QoS can be controlled.

In Japan although the difference between commercial and academic networks has decreased, there are still a considerable number of cases when QoS can be improved by using an Government/Academic Education Network when connecting with an overseas institution.

2-2-3. If you already have a network in place

If you already have a network in place at your conference venue, you will need to check the following with the network administrator.

① Can you connect to the Internet?

It is necessary for existing networks to be connected to the Internet. Some organizations may only have an internal Local Area Network (LAN) and not have an external connection. In that case it will be necessary to request the network administrator to enable internet connection such as the existing network, or create a new internet-connectible network.

② Does existing policy allow networks to be connected to teleconferencing equipment?

Some organizations may ban connection of teleconferencing systems to networks due to administrative or security policies.

By telling your network administrator that you will use a teleconferencing system, you can ensure that the administrator will consider the network requirements. Be sure to submit an application including the purpose of network use to ensure you have proper network access.

Some organizations may have measures in place to block unnecessary Transport Protocol Ports. On this occasion, you should share information about equipment specifications and information from the equipment manufacturer to secure the required Transport Protocol Ports.



③ Do you have a Global/Public IP address for teleconferencing?

Depending on the teleconferencing system you are using, you may need a Global/Public IP address reachable from overseas. You will need to check the connection method as there are different ways to connect and communicate, one being providing the Global/Public IP address directly to the equipment, and the other to provide the equipment with a private IP address that is converted to a Global/Public IP address through the parent network equipment (router or firewall) for communication purposes. Details about Global/Public IP addresses can be found in **Chapter 2-3-1**.

④ Can you generally ensure sufficient bandwidth?

You must check whether you will be able to ensure sufficient bandwidth for your teleconference. At universities and research institutions that have an Government/Academic Education Network in place, you may find that you can use broadband networks at a lower cost than a commercial internet connection. The required bandwidth will vary depending on the teleconferencing system you are using.

Details about bandwidth can be found in **Chapter 2-3-2**.

⑤ Will you have a wired connection in the venue?

There are two ways of connecting with a network. These are a wired connection, using a LAN cable, and a wireless connection, using Wi-Fi. With a wired connection, you can expect stable communications with less interference from external factors than a wireless connection. Using a wireless connection

brings with it the risk of communication quality suddenly deteriorating due to external factors, causing images or sound to be cut off. For teleconferencing, it is best to use a wired connection.

What you should also consider is that even with an effective network in place, there may not be a wired connection to the room you will be using as the conference venue. In this case it will be



necessary to either install a LAN socket in the venue, or run a long LAN cable from the effective network equipment to ensure a wired connection.



⑥ Can you ensure teleconference security?

(When you need to communicate in a highly secure environment)

If your teleconference is highly confidential, it will be necessary to use security technology such as a Virtual Private Network (VPN) or encryption. You will need to check whether your network equipment is compatible with VPN settings and whether it is possible for the network administrator to set this up.

Details about security can be found in **Chapter 2-3-3**.

Table. 2-1 Teleconferencing System and Network Check List

Things to confirm about existing networks	System being used			
	DVTS	H.323	Vidyo	Vidyo streaming
①Can you connect to the Internet? (*excluding cases where a carrier's IP-VPN is used)	✓	✓	✓	✓
②Can you use a Global/Public IP address? (*excluding cases where a carrier's IP-VPN is used)	✓	✓		
③Does policy permit connection of teleconferencing equipment to the network?	✓	✓	✓	✓
④Can you ensure sufficient bandwidth?	✓	✓	✓	✓
⑤Can you use a wired connection in the teleconference venue?	✓	✓	✓	✓
⑥Can you ensure security? (IP-VPN, internet VPN, encryption, etc.)	✓	✓	✓	✓

Once you have confirmed all the above items, the basic components for a network environment needed for a teleconference will be in place. However, without first actually connecting up the teleconferencing system, there are still various issues that could arise. You therefore still need to be careful until you have conducted a successful connectivity test with your conference counterpart.

2-2-4. If you need to establish a new network

If you do not have an existing network in your venue, you will need to establish a new network. Bear in mind that you will need to ensure preparation time of at least few months for this.

① Internet connection contract

To connect to the internet, you need an agreement with an internet line provider available in your country. There are various types of line connections from fiber optic, telecom line, cable TV, mobile to satellite lines.

For teleconference purpose we recommend a high speed line which offers broad bandwidth and with few communication delays. Otherwise, low speed line connections come with increased risks, such as insufficient bandwidth, communication delays and instability.

② Internet provider contact

In addition to the above line connection agreement, you may also need a contract with a internet provider to access the internet depending on your country. It is necessary to choose a contractor by the function you need such as network speed and broadband. Please check which type fits your purpose the best. It may also be necessary to acquire a fixed Global/Public IP address, depending on the teleconferencing system you will be using.

③ Network equipment (Router/Firewall)

You will normally need a piece of network equipment known as a router (sometimes also called a firewall) to access the internet. As it is necessary for the router to be installed and set up by someone with basic knowledge of networks, if you do not have such personnel at your organization you can request the communications carrier or electrician to do the set up for you. As set up will differ depending on the teleconferencing system you are using, it is important to tell the carrier/electrician about the purpose of use and also the details of the teleconferencing system.

④ Wiring and installation work at your organization

There are cases where it will be necessary to lay a physical line from the location where the internet connection line is installed to the conference venue.

Therefore, it is necessary to work with the communications carrier in ① and the electrician/installation contractor in ③, and also the person responsible for electrical facilities at your organization and discuss how to lay a line.

If there is an existing network within your building, it may be possible to extend the internet connection via VLAN, or other means, without having to implement line-laying work.

2-3. Required Network Technology Elements

In this chapter, we explain about the various network technology elements that are needed for telemedicine conferencing.

2-3-1. Global/Public IP address

A Global/Public IP address is the most fundamental element for using the internet. If you are using a communications carrier's IP-VPN, this will not use a Global/Public IP address. Further details can be found in **Chapter 2-3-3**.

1) Global/Public IP address or Private IP address

A Global/Public IP address is an IP address (identification number) that is guaranteed to be globally unique and is allocated to equipment connected to the Internet. By using this address, it is possible to specify the connection point on the Internet and communicate with equipment at the connection point.

On the other hand, an IP address that can only be used on a network (LAN) within an organization is referred to as a private IP address. With a private IP address, it is possible to communicate with other equipment within the organization, but to make external communication using the Internet, it is necessary to use a router or firewall to convert the private IP address to a Global/Public IP address. This process is usually known as Network Address Translation (NAT) and is a widely used network technology.

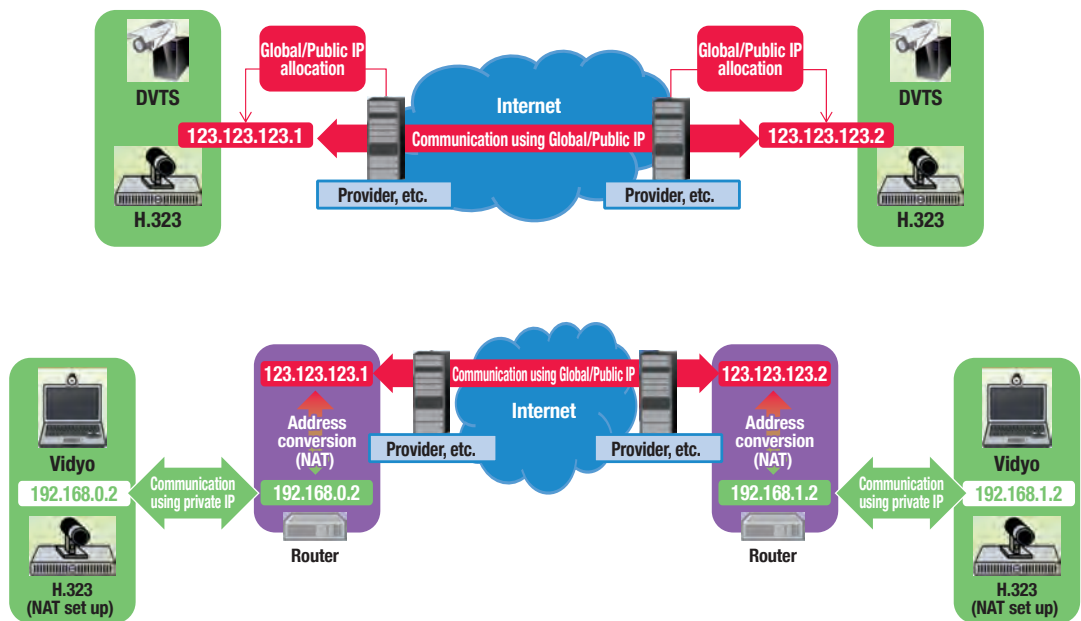


Figure. 2-1 Communication using a Global/Public IP address (top),
Communication with a private IP address being converted to a Global/Public IP address (NAT) (bottom)

2) IP address set up according to system

With all types of teleconferencing system, if you are allocated a Global/Public IP address then you will be able to communicate via the internet without any problems. Although you are unable to use Global/Public IP address, you may be able to communicate when you are connected to the internet with a private IP address that has been converted using NAT.

Here we provide an overview of the requirements for IP address set up, depending on the teleconferencing system.

For details on set up methods, see **Chapter 3** and also the user manuals for each system.

1 H.323

With this system you can directly allocate a Global/Public IP address to your equipment. In addition, with many H.323 teleconferencing systems it is also possible to communicate via the Internet even with a private IP address. In this case it will be necessary to use the NAT function to set up the H.323 teleconferencing system with the converted Global/Public IP address. You will also need to set up port forwarding on the router.

2 Vidyo/Vidyo streaming

This system operates on a standard PC. It is possible to communicate via the Internet using the NAT function, even with a private IP address.

3 DVTS

Normally with this system you allocate a Global/Public IP address to the PC you will be

operating to communicate. If using a PC that has only been allocated a private IP address, the router set up can become complex, so this system is not recommended.

3) Connecting through an internet provider

If you are accessing the internet using an internet provider contract, your allocated IP address is a private IP address. This is because the provider is using a NAT function. In this case you will not be able to use H.323 and DVTS systems, so it is strongly recommended to conclude a contract with another provider through which you will be able to use a Global/Public IP address.

You should also bear in mind that the Global/Public IP address may change each time you connect to the provider (this is referred to as dynamic IP address allocation). In this case, if you are using a H.323 or DVTS system it will be necessary to check the IP address settings each time and confirm the Global/Public IP address is not changed. If you are being called by your counterpart, you will also need to let the counterpart know the new Global/Public IP address each time it changes. In order to avoid this situation, it is necessary to conclude a contract for a fixed Global/Public IP address allocation that will not change each time you connect. It should be noted, however, that a fixed Global/Public IP address contract can be more expensive than for dynamic IP address allocation.

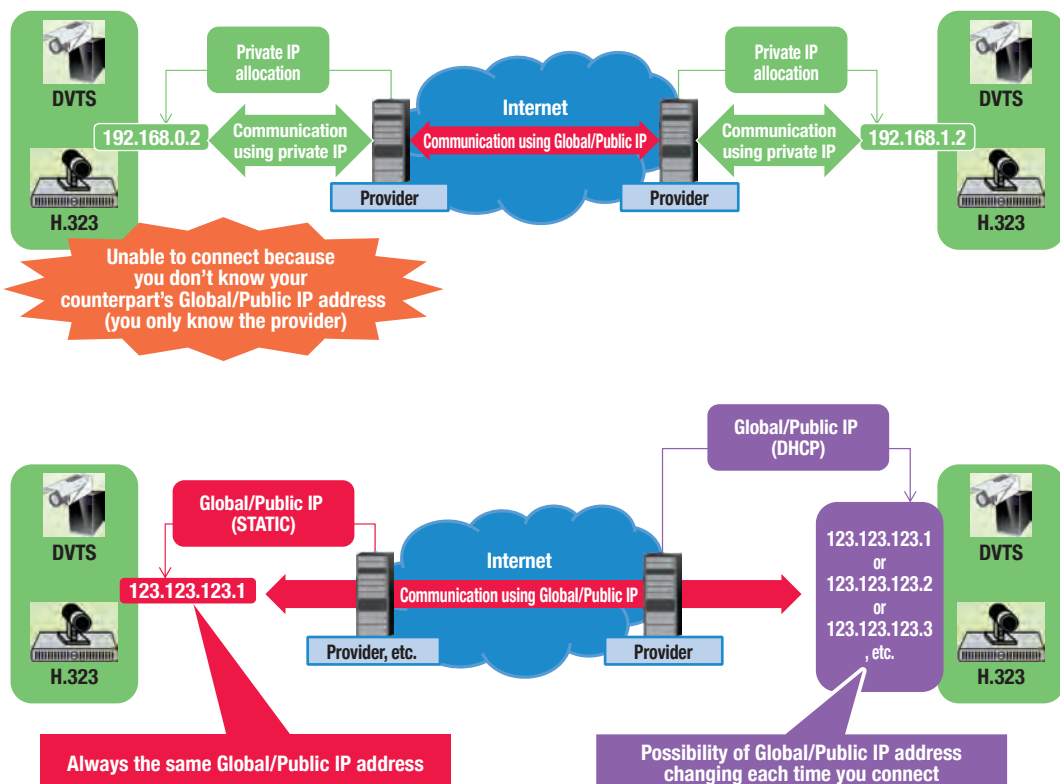


Figure. 2-2 Differences due to IP Address Allocation Method
 Connection with private IP address using NAT function (top)
 Connection using fixed or dynamic Global/Public IP address allocation (bottom)

2-3-2. Network Bandwidth

When a teleconference system is connected to two conferencing counterparts, there is a constant stream of data being sent and received. If the data sent during a certain period is not sufficient or enough, it seriously affects image and sound quality being received by the conference counterpart. In this chapter, we explain about issues relating to data volume transmission capacity, known as “bandwidth.”

1) Explaining bandwidth in a teleconference environment

The volume of data that can be transmitted during a certain time frame over a communication line in an IP network is known as “bandwidth.” In general, bandwidth is also equated with data transmission speed. The unit that is mainly used when referring to transmission speeds is “bps” (bits per second), which is the number of bits (the smallest unit of data) that can be sent in one second. A large bps value for a communication line is referred to as “broad bandwidth” and a lower value is known as “narrow bandwidth.”

On a teleconference transmission, equipment instantaneously digitizes image and sound data and sends it to the conference counterpart, but if bandwidth is too narrow at the point of transmission it becomes impossible to transmit the required volume of data in time.

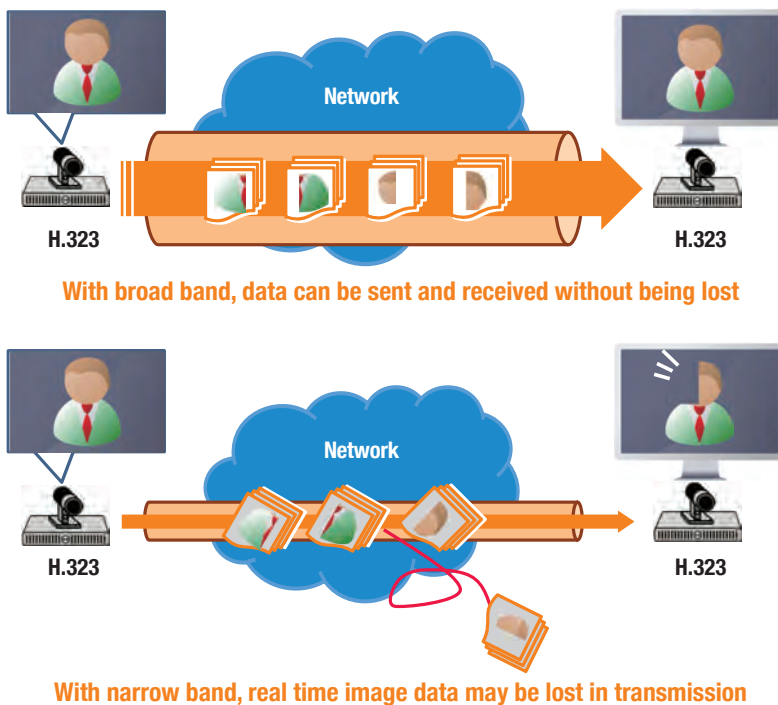


Figure. 2-3 What happens when network bandwidth is insufficient

In the case of image data, this problem can cause images to break up, lose clarity or be delayed. In the case of sound, it can result in sound dropping out, being delayed or not being heard at all. This is why a teleconference requires the use of as broad bandwidth as possible.

In addition, from your own conferencing venue you will be using two types of bandwidth, generally known as upload bandwidth for sending data and download bandwidth for receiving data. Depending on the network it may be the case that the bandwidth differs for upload and download.

2) Recommended bandwidth according to teleconferencing system

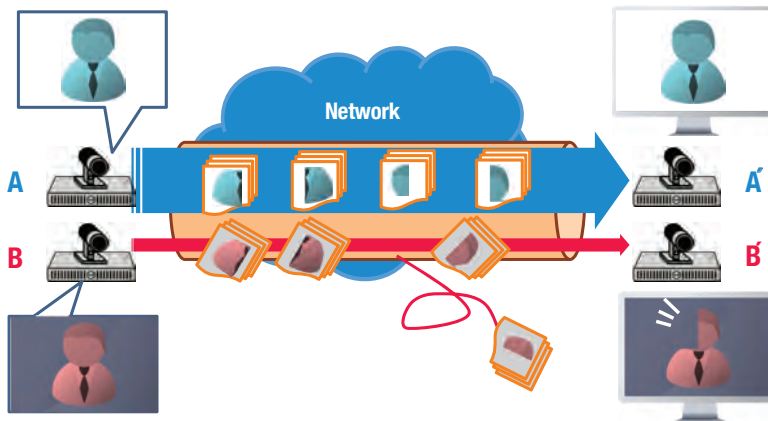
The required bandwidth for communication varies depending on the teleconferencing system you are using. For details please refer to the user manual of your system.

Below we have listed reference values for the recommended bandwidth for different teleconferencing systems, based on the assumption you are connecting with one conference counterpart.

System	H.323	Vidyo	Vidyo streaming	DVTS
Purpose of use	Conference	Conference	Viewing via streaming video on a conference	Sending image contents
Required bandwidth	(Up/Download) From 1 Mbps	(Up/Download) From 500 Kbps	(Download) From 500 Kbps	(Up/Download) From 30 Mbps
Recommended bandwidth	(Up/Download) 2Mbps	(Up/Download) 1 Mbps	(Download) 1 Mbps	(Up/Download) 30 Mbps

3) Network bandwidth outside your institution

The network outside the facility where your conference is taking place will be managed by a communications carrier. In this case the carrier generally provides what is referred to as “best-effort delivery.” This means that there is no guarantee that you can use the maximum bandwidth available on the network. A simple example of this would be a case in which one user on the same network uses 90Mbps of bandwidth on a network that has a maximum 100Mbps of bandwidth. This would mean that you could only use 10Mbps from your own connection. This is the reason why the usable bandwidth on best-effort delivery networks is generally less than the theoretical maximum bandwidth. In the case that bandwidth is drastically reduced, this could negatively impact the image and sound quality of your teleconference. It is also important to note that on days when Microsoft Corporation releases security update programs, data transmission volumes increase, which could reduce the quality of a teleconference. To avoid this situation and ensure you always have access to maximum bandwidth, it is necessary to conclude a contract with a bandwidth guaranteed network service that uses Quality of Service (QoS) control technologies. However, the costs of a bandwidth guaranteed service contract could be several or tens of times more expensive than for a best-effort delivery service contract.



With a best-effort delivery service if bandwidth is being dominated by another user such as A to A' shown here, there is a possibility that real time transmission of image data could be delayed or lost as shown in the case of B to B'.

Figure. 2-4 Best-effort delivery service

4) Network bandwidth within your institution

We have just described scenarios about network bandwidth outside your organization, but the same thing can happen within your institution if many users are all connecting to the same internal network. However, with an internal network it is possible for the network manager to control bandwidth by adjusting QoS as described above. For example, it is possible to prioritize communications via teleconferencing systems over other forms of communication. If image or sound quality on your teleconference is severely affected due to bandwidth problems, it will be necessary to ask your network manager to adjust QoS.

2-3-3. Security

As a telemedicine conference often includes personal information about patients, it is important to give due consideration to security. You will need to take particular care when holding a teleconference that connects to an external network. In this section, we explain about network security.

1) Necessity for teleconference security

For teleconferences on IP networks, image and sound data are sent in units known as “packets” and are delivered to the conference counterpart via multiple network devices. If these packets can be eavesdropped by a third party on the Internet, there is a possibility that your image and sound data could be decoded and the content of your conference leaked to outsiders. Particularly when using the internet it is almost impossible to know, for sure, what kind of network devices are relaying

data to your counterpart. Therefore, you must understand that there are always risk of information being exposed in transmission. There are also cases where bugs in the internal programing of teleconferencing systems thus making them vulnerable from external interference.

Some teleconferencing systems can be vulnerable to bugs entering into the internal program by external and illegal access. In such interferences made against a vulnerable system, there is a risk of leakage of information.

Therefore, it is essential to think about security and how to protect equipment and information from malicious third parties.



2) Cases that require special security considerations

When considering security, it is necessary to keep in mind the content of the teleconference. For example, if the information to be used is already available to third parties then there should be no issues regarding security. However, in cases such as those listed below, the leakage of information could have very serious repercussions and you need to pay a special attention for security.

- When personal information such as patient information (including facial images, etc.) is involved.



- When necessary consideration for the privacy of patients, such as images during the surgical procedures, is required.



- When the exclusive and organizational purpose only information is included.



3) Methods to ensure highly secure communications

There are multiple methods to ensure highly secure communications between you and your counterparts. Here we explain general methods based on IP network technologies.

For the methods described here, it is necessary for all connecting institutions to adopt the same security method. For this reason, it is necessary to consider the content of the teleconference and come to an agreement with your conferencing counterparts about what security methods to adopt.

We have ranked the security methods below in order of their security level. It is possible to further boost security by combining several methods.

Due to its mechanism it is not possible to use methods ① and ② with Vidyo (including Vidyo streaming).

① IP-VPN through a communications carrier

This is a method of communication using a Virtual Private Network (VPN) provided as a service by the communications carrier. This service is isolated from the internet and is only available to users that have concluded a contract with the carrier. Therefore, it is safer than connecting via the Internet and the router setup is relatively simple. In that case, we use private IP addresses. However, this system is limited by the fact that all conference participants will need to conclude a contract with the same carrier and it will be impossible to use this system in regions where the carrier does not provide service.

If you will be making international conference calls, it will be necessary to check whether or not it is possible for the carrier to provide interconnectivity among all participants.

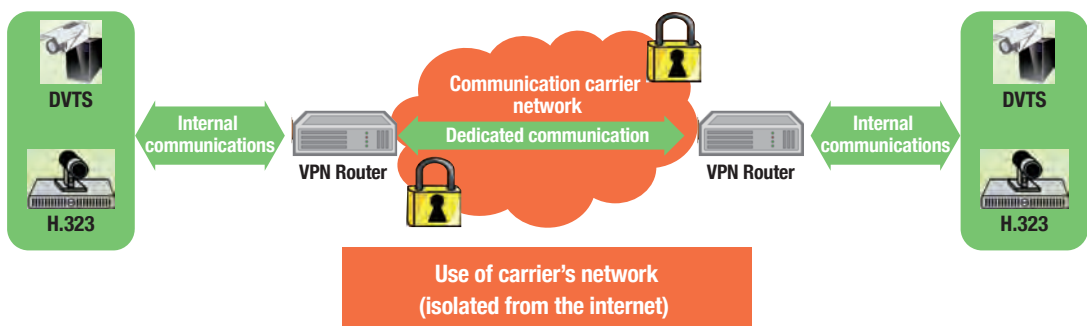


Figure. 2-5 IP-VPN via communication carrier

② Internet VPN (IPsec-VPN, SSL-VPN, etc.)

This is a method that constructs a VPN between the routers of multiple participants connected to the Internet. In contrast to the method described in ① above, this method can normally be used if you are connected to the internet. Through this method, an encrypted VPN is created for communication channels using IPsec or SSL technology that has been previously provided to the connected routers. After the VPN is created, all communications are encrypted and encapsulated for transmission, ensuring security of content. However, for this method, specialist network knowledge is required to adjust the router and it is also the case that communication speeds could decrease or delays could arise in comparison to standard non-encrypted communications.

As encryption technology like IPsec is standardized it should be possible to connect if you have a compatible router. On rare occasions, however, there may be compatibility issues between routers produced by different manufacturers that make it impossible to connect. There may also be cases where the encryption method is unique to the router manufacturer. It is for these reasons that it is essential to check the manufacturer of routers of all conference participants and conduct a VPN connection test.

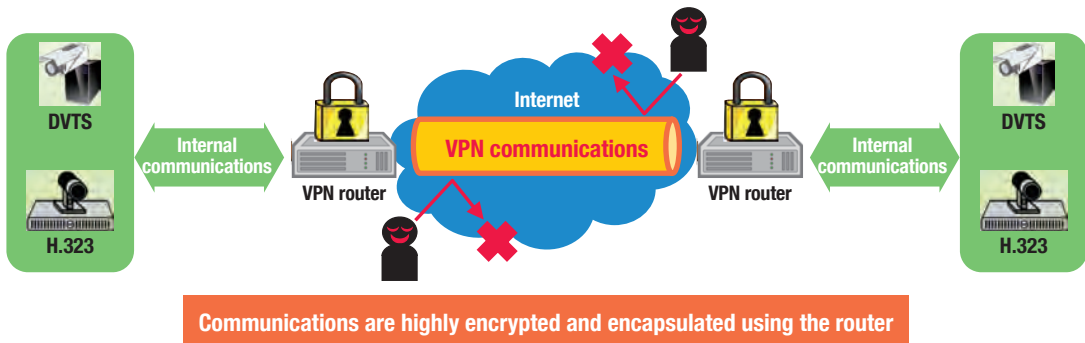


Figure. 2-6 Internet VPN

3 Encryption using teleconferencing system functions

If your teleconferencing systems have encryption functions, you are able to make your network more secure.

- **H.323** Many H.323 devices have encryption functions. Encryption is implemented either using a standardized method (ITU-T: H.233, H.234, H.235), or a method unique to the device manufacturer. If you and your counterparts are using identical devices made by the same manufacturer, you will be able to connect using either method. However if you are using devices made by different manufacturers, you will have to connect using the standardized encryption method.
- **Vidyo** If you add the encryption option when using Vidyo, communication among participants on the teleconference will be automatically encrypted (AES).

4) Security measures for teleconferencing systems

In order to prevent attacks on the teleconferencing system by malicious third parties, it is necessary to ensure you have security measures in place for equipment and devices.

- **H.323** Regularly check with each manufacturer for firmware and software updates. If an update is available that responds to vulnerability issues, you should download the update file and apply it to your equipment. In addition, for equipment that can be remotely controlled, it is necessary to either disable the remote control function, or alternatively, specify which IP addresses can connect or create a complex password that will make it difficult to control the equipment from a remote site.
- **DVTS, Vidyo, Vidyo streaming** As these systems operate on personal computers, it is necessary to check regularly for OS security updates and updates from the manufacturer. It is also essential to implement basic security measures, such as installing anti-virus software.

2-3-4. Setting up equipment and confirming connectivity

To create a teleconference, you will prepare and set up actual equipment. You will connect after implementing network setup, including the allocated network IP address, net-mask, and default gateway.

If you are able to run a connectivity test (Ping, etc.) from your system, please check communications with the default gateway and the external web server.

If possible, we recommend testing system connectivity by running a test call. By actually sending and receiving data between your and your counterpart, you will be able to check if there are any issues or glitches that affect interactive communication.

Chapter

3

Teleconferencing Systems

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Authors ● Yasuaki ANTOKU, Kuriko KUDO,

Shunta TOMIMATSU, Yoshiko HOUKABE

Chapter 3

Teleconferencing Systems

In this chapter, we explain about the various equipment and devices for teleconferencing systems used in telemedicine conferences. In **Chapter 3-1**, you will find information about the various characteristics and points of caution about equipment.

In **Chapter 3-2**, you will find information about how to use teleconferencing systems and audio mixers.

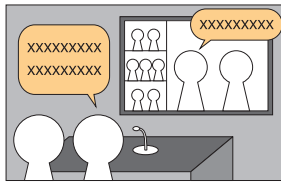
KEY POINTS

	Listening/ watching only	Participating in a conference	Making a presentation
	★ ★ ★	★ ★ ★	★ ★ ★
Equipment for telemedicine conferences			
● Teleconferencing system (H.323, Vidyo, DVTS, etc.)	✓	✓	✓
● Audio equipment (Input: Microphone, Output: Audio speaker)	✓	✓	✓
● Visual equipment (Input: Video camera, etc., Output: Display monitor, etc.)	✓	✓	✓
Teleconferencing system basics			
● Terminal-type/Server-client-type	✓	✓	✓
● Software-type/Hardware-type	✓	✓	✓
● With streaming, only an audio image is received and discussion is not possible	✓		
H.323 teleconferencing system			
● Internet connection with Global/Public IP address		✓	✓
● Multipoint Control Unit (MCU) for connecting more than three sites		✓	✓
● Cannot use "contents sharing" for sharing video materials, must switch "switching image source from camera to PC"			✓
VidyoDesktop			
● Connect to server called VidyoPortal		✓	✓
● Use recommended microphone device, internal PC microphones cannot be used		✓	✓
● Unselect the "Auto Adjust Microphone Level"		✓	✓
● To share PowerPoint slides, share your entire desktop and when presentation is over be sure to stop sharing			✓
● VidyoRoom is required for sharing movie materials			✓

	Listening/ watching only	Participating in a conference	Making a presentation
	★ ★ ★	★ ★ ★	★ ★ ★
Audio equipment			
● Prevent echo by using mix-minus		✓	✓
● Keep microphone off when you are not talking		✓	✓
● You cannot hear echo originating from your site yourself		✓	✓
● Use Gain Control to adjust sound quality, such as the sound is breaking up, etc.		✓	✓



★ ★ ★
Listening/watching only



★ ★ ★
Participating in a conference



★ ★ ★
Making a presentation

3-1. Equipment Types and Combinations

Equipment required for telemedicine conference are broadly divided into two categories: audio equipment, such as microphones and audio speakers, and visual equipment, such as video cameras and displays. Each connecting site will have a setup shown in Figure. 3-1. The audio and visual equipment is connected to the teleconferencing system, which is connected to the internet. The section numbers in the figure show where you can find information about each piece of equipment.

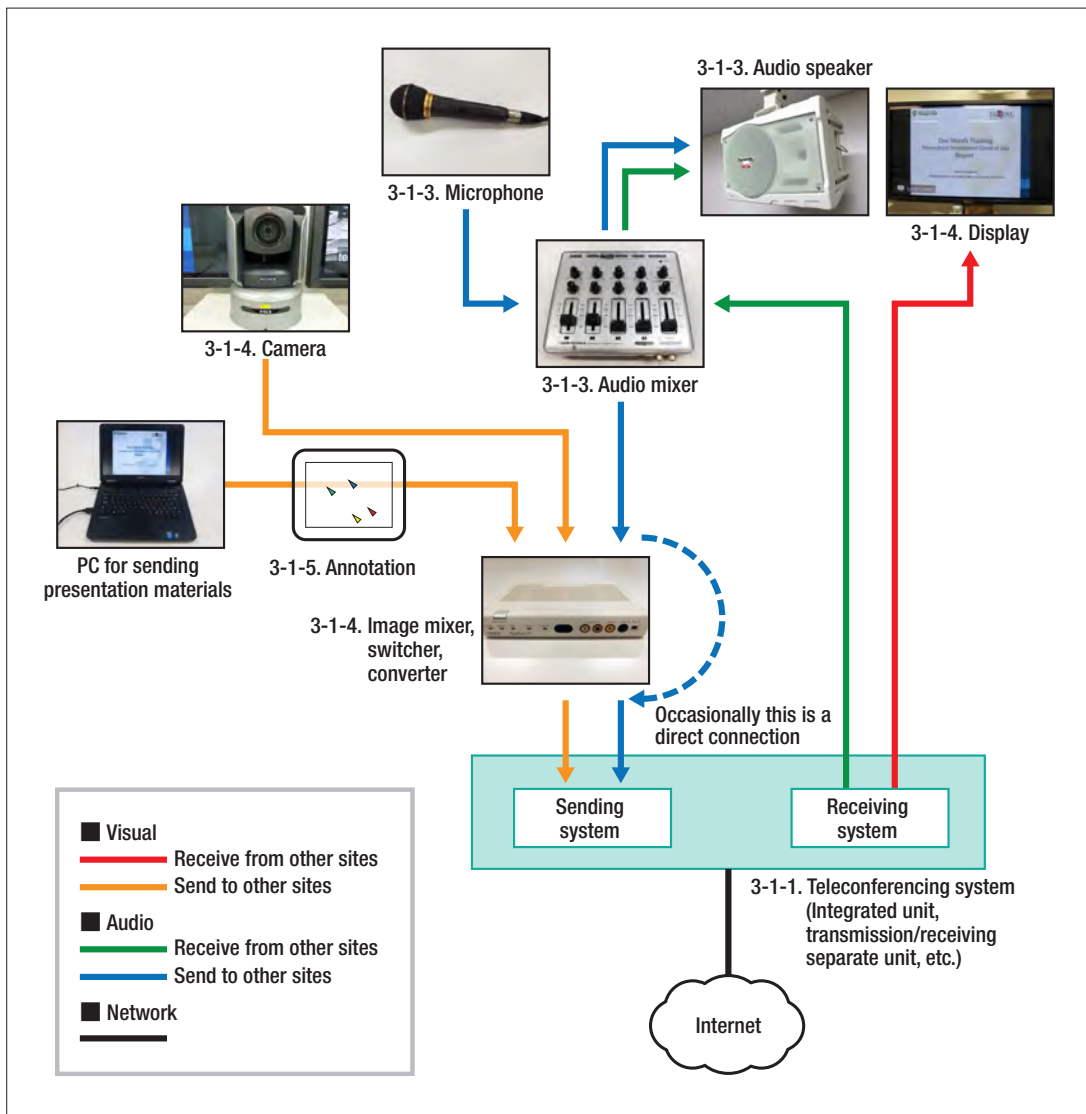


Figure. 3-1 Standard Equipment Setup for Telemedicine Conferencing

3-1-1. Teleconferencing systems

As explained in **Chapter 1-3-1**, teleconferencing system equipment is either hardware or software-based. In addition, the network connection for the equipment is either terminal-type or server-client-type. Take a look at Figure. 3-2 to understand the various characteristics of each system type. Here we explain two representative systems: H.323, which is a terminal-type/hardware-based system, and VidyoDesktop, which is a server-client-type/software-based system. There are various other formats available, including a transfer protocol known as SIP and web conferencing, but we do not include them here.

	Terminal-type	Server-client-type
Setup image		
Characteristics	<ul style="list-style-type: none"> • A single commercial terminal costs from \$10,000 upwards • Each participating site will need to setup a terminal • Sound and image quality is relatively good 	<ul style="list-style-type: none"> • High-cost server, low-cost for clients • Relatively easy to connect • Image quality can be compromised

Figure. 3-2 Two types of teleconferencing systems

1) H.323

This is a system that uses a standardized transfer protocol (ITU-T) known as H.323. The H.323 teleconferencing system is generic and sold by various manufacturers. In many cases, the H.323 teleconference system includes a camera and a microphone, and it is necessary to have displays and audio speakers ready. A network with a Global/Public, once you set them up, it is simple to communicate by entering counterparts' IP address. Although there are various items that need setting on a H.323 system, once you set them up, it is simple to communicate by inserting the IP address of the conference counterpart. The terminal can communicate with one communicating point, and it will be necessary to have a multipoint control unit (MCU) for connections 3 sites or more (Figure. 3-3). There are terminals available that feature MCU functions.

In general, with a H.323 system it is possible to connect even if they are using equipment by different manufacturers. However, as the configuration of adjusting network bandwidth (negotiation) depends on the equipment being used, by changing the calling counterpart and the connection

bandwidth the actual value of the connection bandwidth changes. To achieve better connection quality, we recommend that you change these settings to see if they make a difference.

There are two methods for sharing presentation materials such as PowerPoint slides: “switching image source” and “contents sharing.” “Switching image source” setting enables you to switch between a camera and the screen of the presentation on PC and select which image to send. The “contents sharing” uses protocol like the H.239, and it is possible to send both the camera and the PC display images simultaneously. If your equipment is “contents sharing” compatible (See P. 123 Appendix 3 “H.323 Teleconferencing System List”), then you should be able to use this method, but you need to be careful as occasionally the display layout may be different or it may not be possible to share contents, depending on the terminals in other connected sites. Also, as the main purpose of “contents sharing” is to share high resolution still images such as presentation slides by dropping the frame rate, this method is not suited to sharing video materials. **If you are sharing data that includes slides with embedded medical-related videos**, such as videos of surgery, etc.,

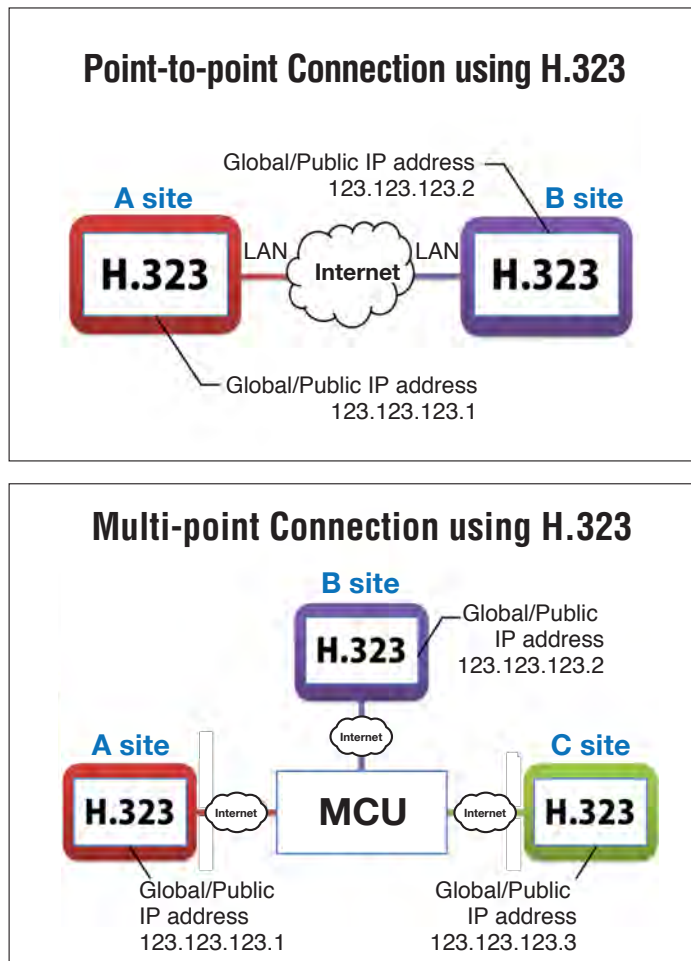


Figure. 3-3 Different Formats Depending on the Number of Connecting Organizations using H.323
Top) Point-to-point connection, Bottom) Multi-point connection

you should use “switching image source” instead of “contents sharing.” Take a look at **Chapter 3-2-1 “4) Sending presentations”** for more details. These presentation sharing functions are only for sending images and do not normally include sound. If you want to send materials that include sound, you will need to hook up the sound output from the PC you are using for the presentation to the sound input on the teleconferencing system.

2) VidyoDesktop

The Vidyo system is provided by Vidyo, Inc., and is a server-client-type teleconferencing system. There is a hardware-based system called VidyoRoom and a software-based system called VidyoDesktop.

The VidyoDesktop system can be used on Windows, Mac and Linux-based systems, and also on mobile terminals and tablets like iPhone and Android.

Vidyo systems do not require a Global/Public IP address and as long as you have an internet connection you will be able to communicate. See **Chapter 3-2-2** for further details.

3-1-2. Streaming

Streaming is a method of one-way transmission and is most often used in a format where users watch and listen to a streaming webcast from an internet browser. You will be able to receive stream if you have a PC which is connected to internet, and audio speakers. Streaming uses at most 1 to 2 Mbps of bandwidth and it is possible for several hundred users to watch contents simultaneously. For further details see **Chapter 3-2-3**.

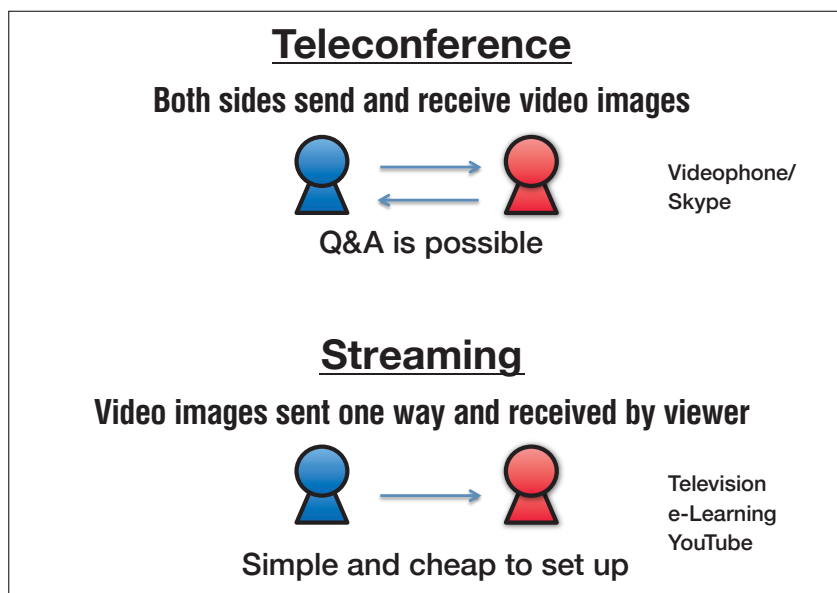


Figure. 3-4 Teleconference and Streaming

3-1-3. Audio equipment

Audio setup basics: Mix-minus sound setup

In order to eliminate echo from a teleconference, it is necessary to differentiate between the microphone sound from the venue (transmitted voice) and the receiving sound (sound from another sites). Take a look at Figure. 3-5. The outputs from the audio speakers in the venues are microphone sound from the venue (Figure. 3-5 red line) and the received voice from the teleconferencing system (Figure. 3-5 green line). However, in terms of the **transmitted audio that is sent to the teleconferencing system, only the microphone sound from the venues (Figure. 3-5 red line) is outputted** to ensure that no sound flows from the teleconferencing system. This method of connection is referred to as “mix-minus sound.”

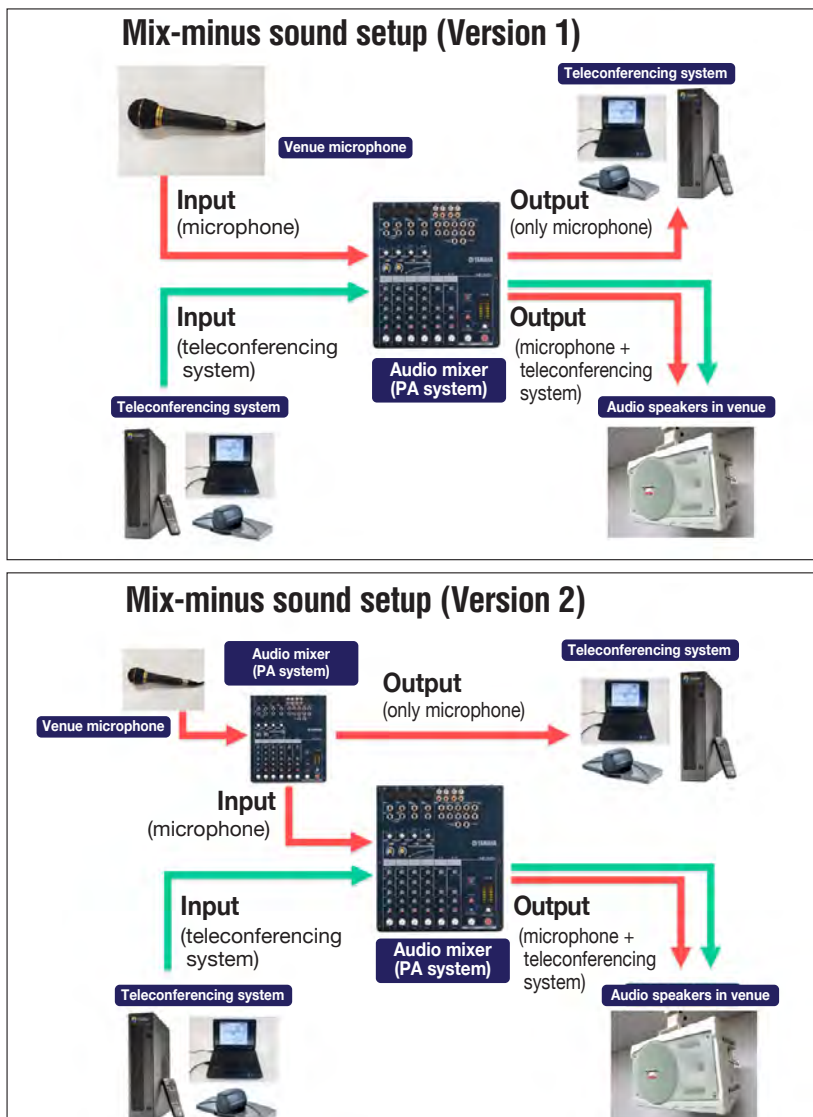


Figure. 3-5 Mix-minus Sound Setup Examples

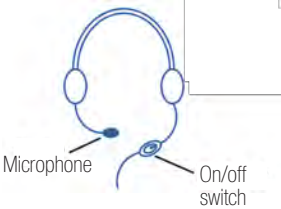
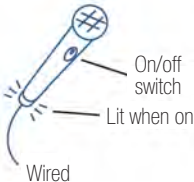
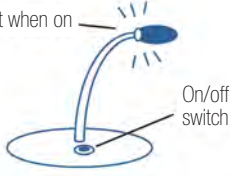
1) Microphones

Microphones are required to send participant's voice. As microphones can cause echo on the teleconference, it is extremely important to ensure that all participants' microphones are always set to mute (off) unless they are actually speaking.



Appropriate microphones for telemedicine conferencing are detailed in Table. 3-1.

Table. 3-1 Microphones Suitable for Telemedicine Conferencing

	Headset	Hand-held microphone	Stand microphone
Illustration			
Recommended user	Surgeon performing live surgery	Questioner/Moderator	Chair/Moderator
Benefits	Hands-free and usually echo-free	Easy to hand around	Hands-free/Does not need to be worn
Hints for choosing equipment	On/off switch in accessible position	Has on/off switch Can visually confirm when on/off Color differentiation when using multiple devices	Has on/off switch Can visually confirm when on/off

Microphones can be classified by their characteristics, as shown below.

Table. 3-2 Types of Microphone: Different Methods for Changing Sound to Electrical Signals

	Dynamic Microphone	Condenser Microphone
Power source	Not needed	Needed (batteries, plug in power)
Handling	Sturdy	Delicate
Size	Relatively big	Miniaturization possible
Sensitivity	Little distortion at high volumes	High distortion at high volumes
Overall evaluation	○	△

If a dynamic microphone is connected to a plug for condenser microphone, or vice-versa, it may generate noise on the connection.

Table. 3-3 Types of Microphone: Wired or Wireless

	Wired Microphone	Wireless Microphone
Cost	Cheap (Around \$100)	Expensive (Several times more expensive than wired)
Anti-noise performance	Good	Caution required
Receiver	Not needed	Needed
Cable setting	Needed	Not needed
Overall evaluation	○	△

Table. 3-4 Types of Microphone: Directional Range

	Unidirectional	Omnidirectional
Noise/echo	Does not easily occur	Easily occurs
Overall evaluation	○	△

Unidirectional microphones are primarily sensitive to sounds from one direction. Omnidirectional microphones can pick up sound from all directions.

At first glance an omnidirectional microphone may seem to be the best option, but as they also tend to pick up sound from the speakers they can also cause echo. We suggest using a unidirectional microphone.

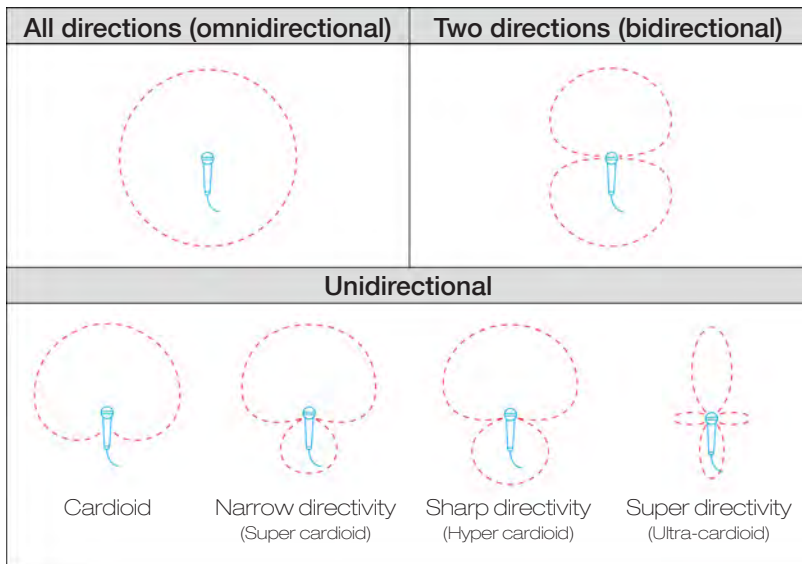


Figure. 3-6 Microphone Directivity

2) Audio Speakers

Using audio speakers, participants in your venue will be able to hear the sound from local and remote sites. Similarly to microphones, you will need to be aware of the risk of echo when using audio speakers. Depending on the distance and compatibility with the microphone, it might be that the microphone picks up audio speaker sound and feeds it back to the conference counterpart, creating an echo. With this type of echo, **you will not realize if it is your site that is creating the echo.** You will need to make adjustments in advance with other sites, or prepare two separate systems and conduct a self-test, simulating a conference environment as if two participants were connected.

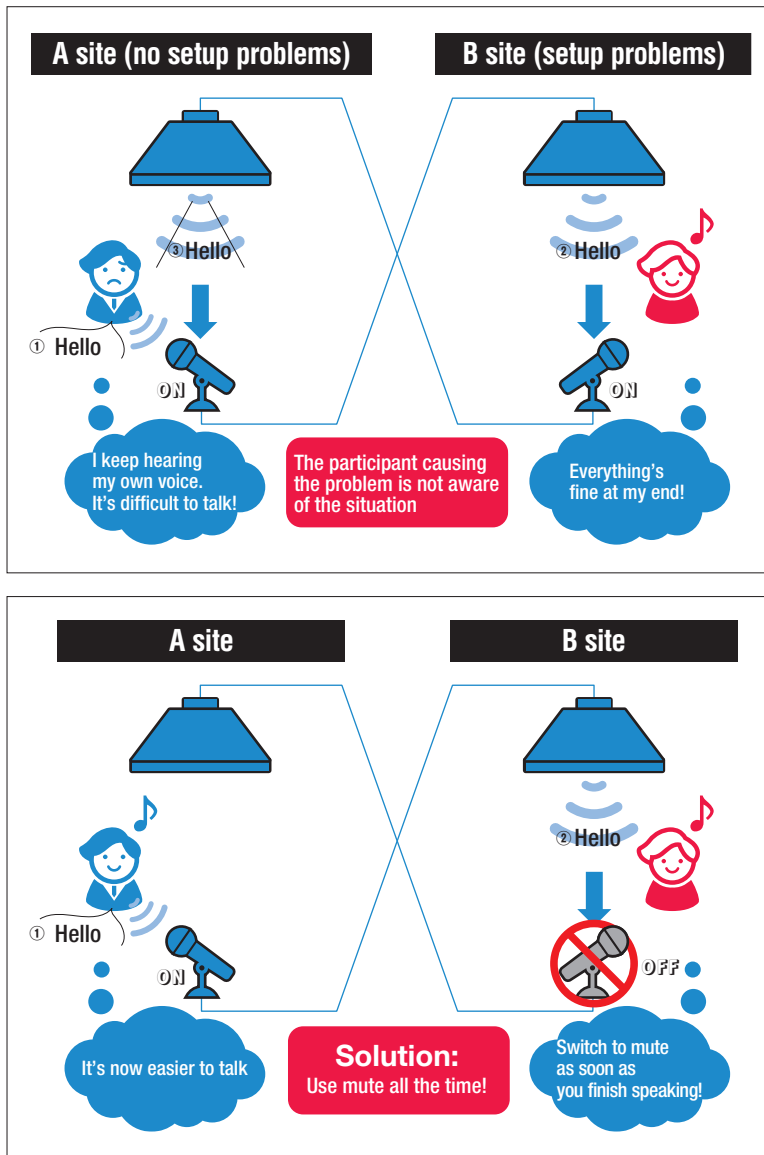


Figure. 3-7 Top) How an Echo Occurs
Bottom) Solution Using Mute Function

3) Combine microphone and speaker devices

Some teleconferencing systems use a two-in-one device, which combines the microphone and audio speaker, such as a headset or speakerphone. With a headset, the audio speakers are in effect the headphones, attached to your ears, so the microphone will not pick up any audio speaker sound. This is one way to prevent echo in a teleconference. There are also combined speakerphones with echo-cancelling functions. These make it possible to send echo-free sound simply by connecting and so they are well-suited for use with software-based systems like VidyoDesktop. We advise you to use a device that is recommended for the teleconferencing system you are using.

While combined microphone/audio speaker sets are convenient, their sound pick up coverage is limited and so they are best used in small-scale venues.

4) Audio mixers

An audio mixer is convenient for making fine adjustments to audio, by distributing and combining sounds and fine-tuning the volume. However, audio mixers tend to have many knobs and dials and require specialist knowledge to use properly. For further details on use, see **Chapter 3-2-5**.

3-1-4. Visual equipment

1) Cameras

This is a device for inputting moving images. The connection method will depend on the device itself, such as a video camera or web camera. A camera that can be mounted on a tripod (Figure. 3-8) may be a good idea. If you are using a camera with a builtin microphone function, be aware that any unwanted sounds will be inputted into the teleconferencing system and may cause echo.



Figure. 3-8 A Web Camera attached to a Tripod

① Dedicated camera

This type of camera is exclusively for use with a teleconferencing system. It may have a remote control or be controllable from the teleconferencing system itself. While this type makes it easy to handle high-quality images, the costs are also high.

② Video camera

Home-use video cameras are often used in many situations because they are easy to handle. If you use a home-use video camera with your teleconferencing system, it will mean leaving the camera switched on but not actually recording for long periods. This can be problematic because most standard home-use cameras have an automatic switch-off, or can also go into power-saving mode or demonstration mode (Figure. 3-9). If you use a home-use video camera, you will need to disable the automatic shutdown/sleep mode function in advance.



Figure. 3-9 Example Image of Demonstration Mode

③ Web camera

Web cameras are used with software-based systems like VidyoDesktop. Many web cameras use a USB connection and it is best to use a device recommended for use with your teleconferencing system. Although web cameras are easy to use, as they lack a zoom function it may be necessary for you to switch to a different type of camera depending on your needs.

2) Video mixer, switcher, converter

These devices are used for video images when you need to convert video signals, or when you need to mix multiple input sources and send them out from the teleconferencing system. These devices are compatible with teleconferencing systems not only for signal formatting, but also for adjusting things like resolution and the frame rate. If you use multiple devices you should be aware that this could cause delays or image degradation.

3) Display

Depending on the teleconferencing system, you need one or two displays. These are used to display images from your conference partner, your own images, and also to share presentation materials (Figure. 3-10). There are various types of display, including LCD, plasma and projectors. Although displays can show images in fine detail, the image size is fixed to the size of the screen. With a projector you are able to change the display size freely, but you will need to ensure that the conference venue is dark so that the image can be seen clearly.



Figure. 3-10 Example of Two-screen Display Setup

3-1-5. Annotation

In the case of teleconferencing, “annotation” means to add additional information to the images being shown, either by pointing, or by overwriting notes or diagram over the image (Figure. 3-11). Annotation makes for smoother communication among remote participants.

Recently H.323 systems and web-conferencing systems include annotation functions, enabling you to easily overwrite notes or draw diagrams using a graphic tablet. Although the costs of acquiring an annotation-compatible server is high, it is possible to connect such a server to any teleconferencing system.

There are various ways to use annotation, and they involve different costs, criteria for writing (e.g. only on still images, or also on moving images), and output formats. It is therefore necessary to select a method that fits best with the requirements and purpose of use of each organization.

1) Tele-pointer

A tele-pointer is one type of annotation software that can be combined with a teleconferencing system. This is a type of software that shares the cursor position from a remote location. In teleconferences that use pathological images, it is used for the purpose of enabling remote participants to point to and comment on specific sections of the presenter's slides (Figure. 3-12).

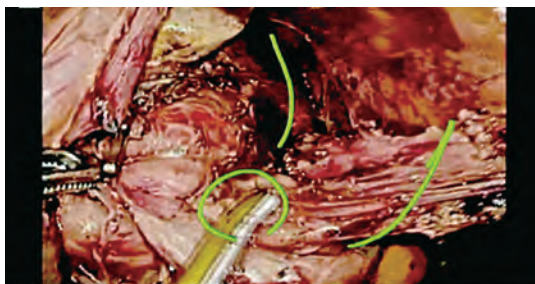


Figure. 3-11 Example of Surgery Video Being Sent with Annotation

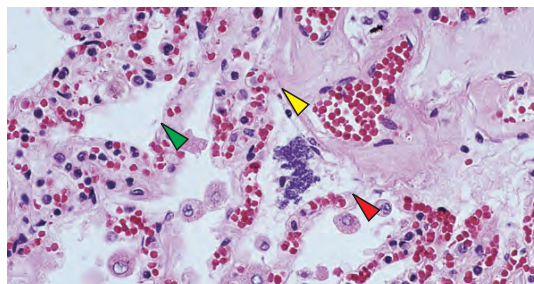


Figure. 3-12 Display of Pathological Image Using a Tele-pointer

3-2. Specific methods for using equipment

In this chapter, we show specific methods for using teleconferencing systems and audio mixers.

3-2-1. H.323 (Using Cisco SX20)

1) Equipment connection

You connect the required equipment to the H.323 teleconferencing system: power source, network, microphone, audio speaker, camera, display, etc. (Figure. 3-13)

For details on equipment setup, review **Chapter 3-1**.

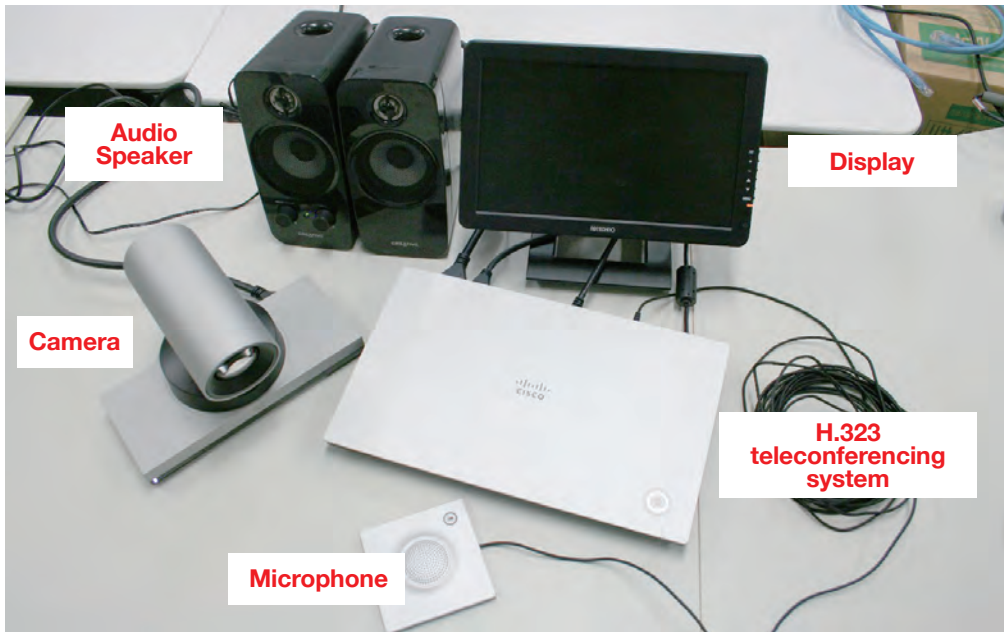


Figure. 3-13 Setup for H.323 Teleconferencing System

2) Configuration

You first need to setup all the different Configuration, including the network, image and sound.

■ Network Configuration

**DNS Configuration: Home – Settings – Administrator Settings –
Advanced Configuration – Network 1 – DNS (Figure. 3-14)**

**IPv4 Configuration: Home – Settings – Administrator Settings –
Advanced Configuration – Network 1 – IPv4 (Figure. 3-15)**

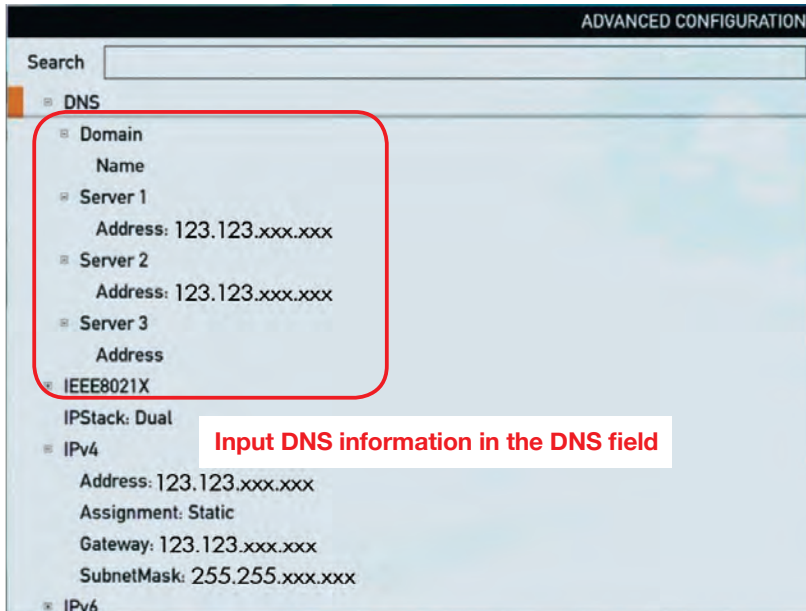


Figure. 3-14 DNS Configuration

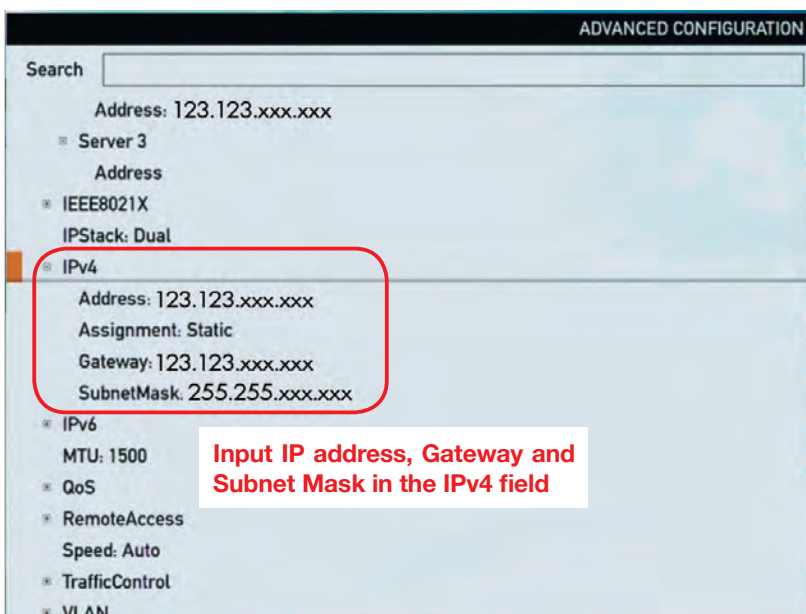


Figure. 3-15 IPv4 Configuration

3) Call

Input the IP address of your conference partner and call out. (Figure. 3-16, 17, 18)

If you can't get through or if there are quality issues, make adjustments by changing the side who is calling out, or changing the bandwidth settings. (Figure. 3-19)

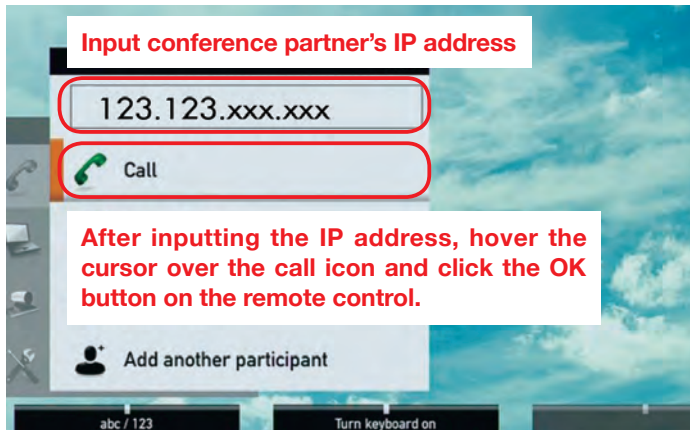


Figure. 3-16 Call Screen

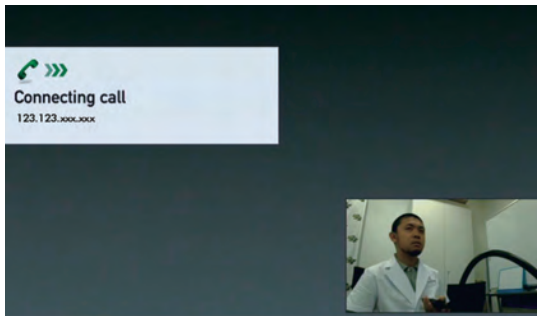


Figure. 3-17 Connected Screen
(When you are making the call)

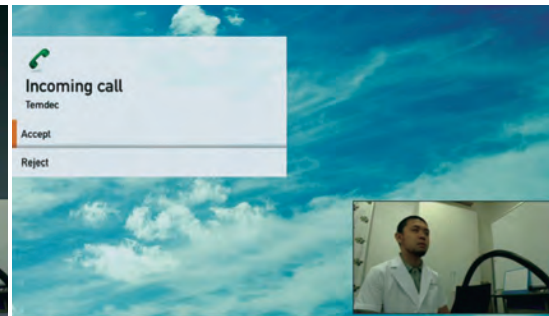


Figure. 3-18 Connected Screen
(When you are receiving the call)

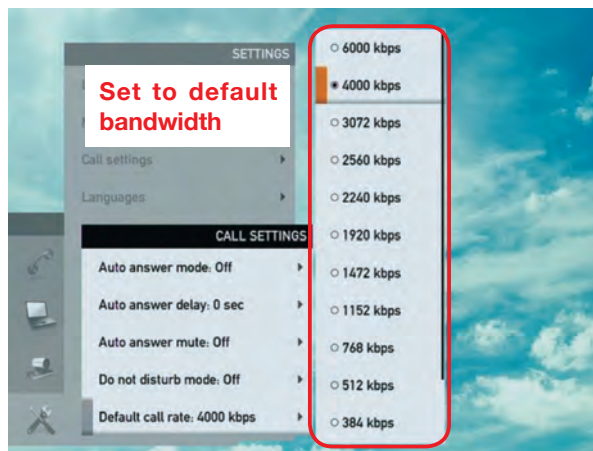


Figure. 3-19 Bandwidth Mode Setting Screen

If you are using a room number with MCU, etc., you make the call this way.

Room number@IP address

Note that this format depends on the system manufacturer (Table. 3-5).

Table. 3-5 Different Room Number Input Methods Depending on Equipment

Maker	Input method
Polycom	IP address ## room number
Annex0-type (Cisco, Tandberg)	Room number@IP address
Sony	IP address # room number
Viewstation	IP address, room number

4) Contents (presentation slide) sharing

There are two methods for sharing presentation materials, detailed below. These sharing functions are for images only and generally do not include sound. If you want to send materials that include sound, you will need to hook up the sound output from the PC you are using for the presentation to the sound input on the teleconferencing system.

- **Switch image source: Home – Settings – Main Source (Figure. 3-20)**

This is a method that converts sent images from the camera to a PC screen. This method is good for sending moving images.

- **Contents sharing: “Contents sharing” button on remote control (Figure. 3-21)**

This is a method that sends images from the camera and simultaneously sends the image on the PC screen. Some devices do not have this function and it is not suited to sending moving images.

When the presentation is over, be sure to stop the sharing function.

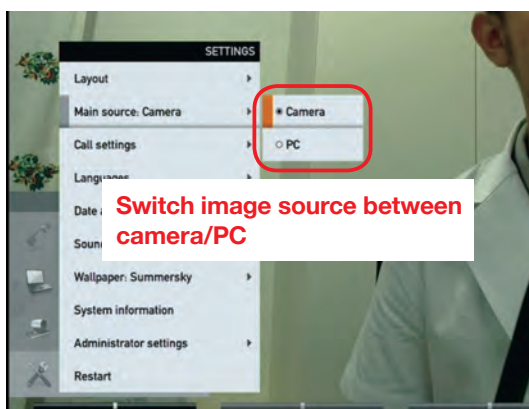


Figure. 3-20 Switch image Source to Camera

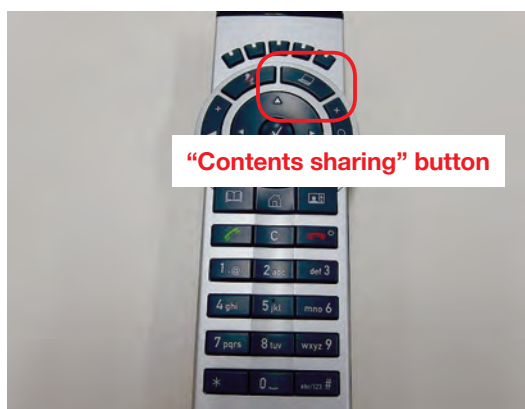


Figure. 3-21 “Contents sharing” button

5) Finish the call

To finish the call press the “End Call” button (Figure. 3-22, 23, 24).

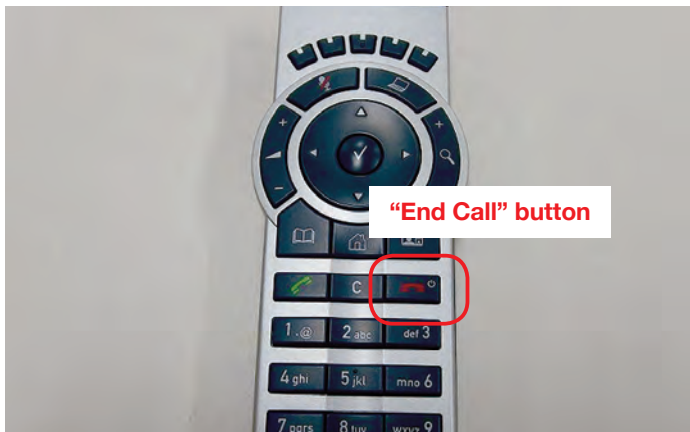


Figure. 3-22 “End Call” Button

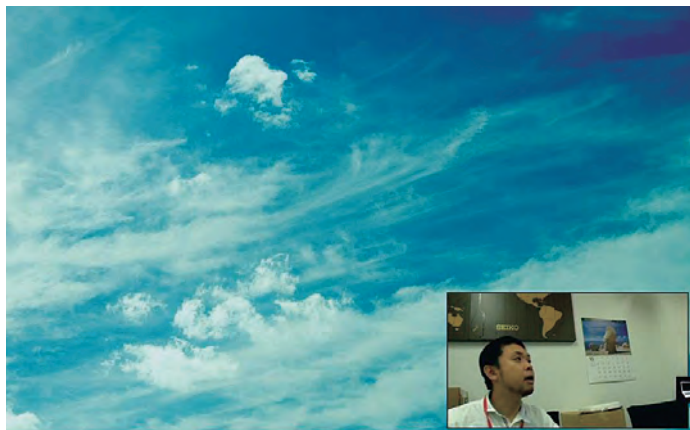


Figure. 3-23 End Call Screen (You end the call)

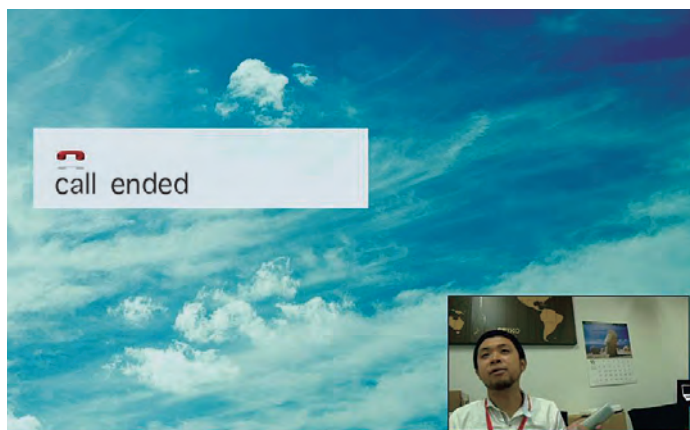


Figure. 3-24 End Call Screen (Your counterpart ends the call)

3-2-2. VidyoDesktop

1) Recommended requirements for Vidyo (ver. 3.6, as of March 2016)

VidyoDesktop	
OS	Windows:10/8.1/8/7/XP Mac:OS X 10.6 or later Linux:Debian7.0; Fedora Core18, 19, 20; openSUSE12.2, 12.3; Red Hat7, 6.1, 6.3; Scientific Linux(SL)6.1, 6.3; Ubuntu12.04, 12.10, 13.04, 13.10, 14.04
CPU	At least Core 2 Duo 2GHz
RAM	2 GB

2) Preparations and installation

- ① Connect your web camera and speakerphone or headset to your PC.
- ② Confirm the PC is connected to the internet.
- ③ Access the URL for the VidyoPortal (transmission server) using an internet browser and click the install button to download VidyoDesktop.
- ④ Run the downloaded program.

3) Login

After starting VidyoDesktop, the login screen will be displayed (Figure. 3-25).

Insert the URL of the server (VidyoPortal) you are using, and the user name and password that have been issued to you. Click on the login button.

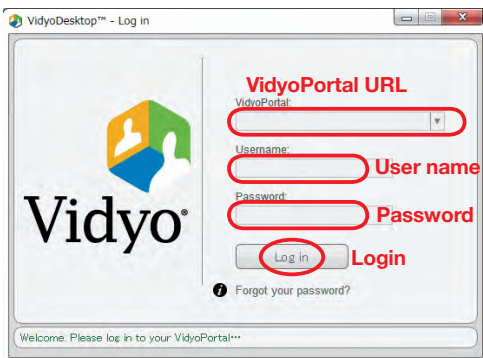


Figure. 3-25 Login Screen

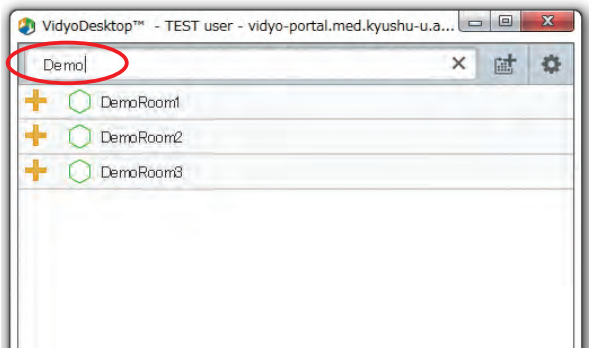


Figure. 3-26 Search for “Demo” in the Search Field

4) How to participate in a room

You need to insert the name of the room you want to connect with or the name of the contact person in the search field (Figure. 3-26). After selecting the correct room (Figure. 3-27), click on the “Connect to XXX” button (Figure. 3-28).

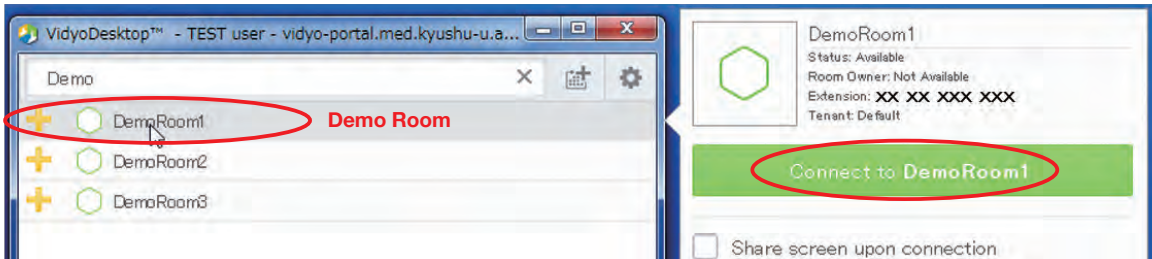


Figure. 3-27 Screenshot of Search Screen

Figure. 3-28 Connect to Room

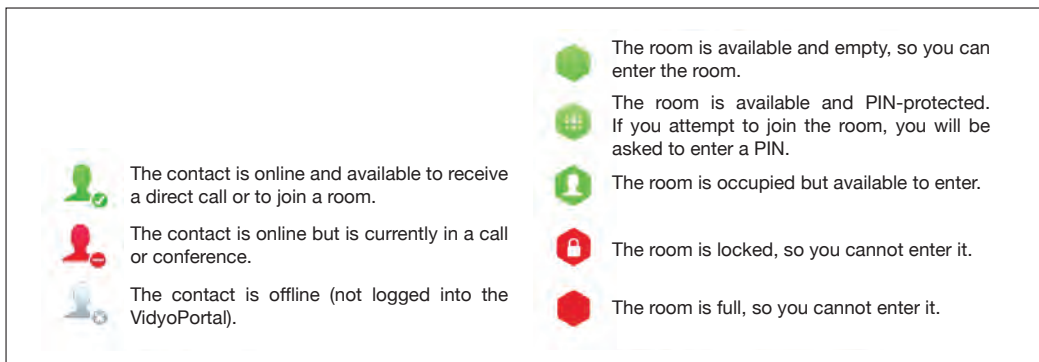


Figure. 3-29 List of Status Icons

5) Operations when in a conference

Once the conference begins, the screen will change to that as shown in Figure. 3-30. See Figure. 3-31 for the explanation of icons.

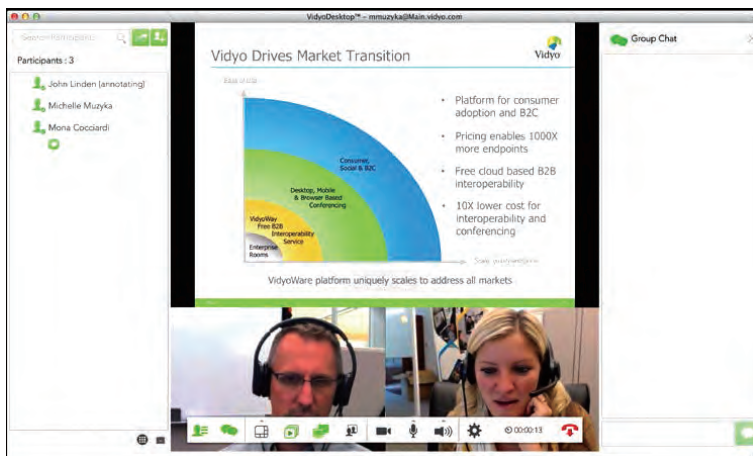


Figure. 3-30 Conference Screenshot

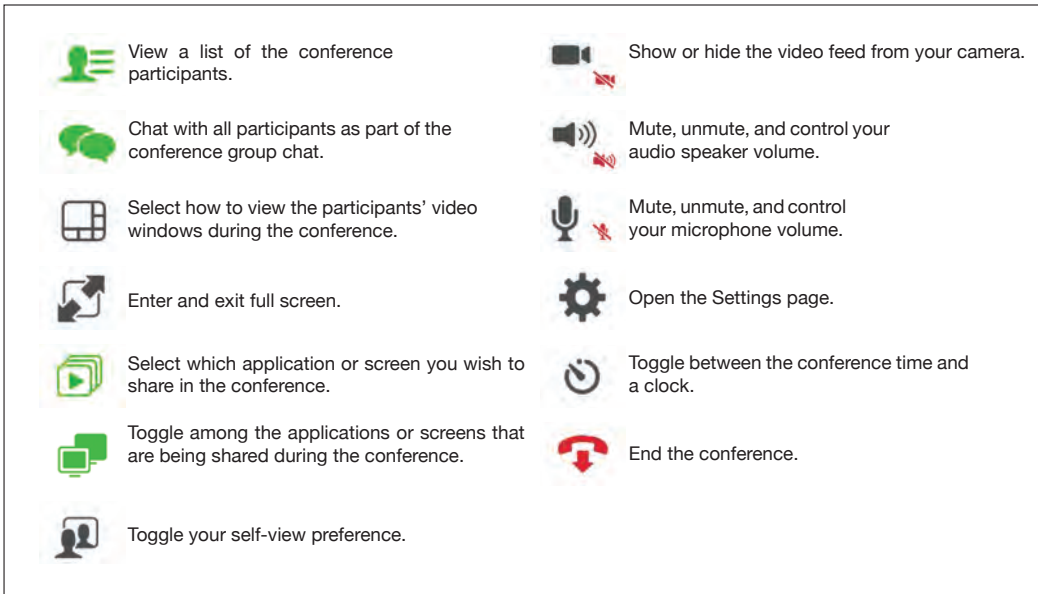


Figure. 3-31 List of menu icons

Points of caution when in a conference.

- Use sound equipment recommended by Vidyo. This will help to prevent noise and echo.
- It is best to use a USB-connected speakerphone or headset. The internal microphone in the PC could cause sound to drop out or create noise.
- Connect sound equipment directly to the PC USB port. Connecting to an external USB hub could impact sound quality.
- Make sure that you have the latest driver software installed for sound device.
- Close all unnecessary applications. This will lower the PC CPU use rate and stabilize conference quality.
- If you can select a “power option” of your PC, select “high performance.” If you are using a notebook PC, make sure it is connected to mains electricity.
- We recommend using a wired network connection rather than wireless.
- If there is a lot of noise around you, move to a quieter location.
- Do not place the sound equipment around any obstructive objects that may cause sound to rebound.

Settings for participating in a conference

- If you are participating in a conference for the first time, the sound equipment settings screen will be displayed. Confirm that the equipment you are using is the equipment that is selected.

- You can open the settings screen from the settings icon ().

- If you are using a headset or echo-cancelling equipment, uncheck the “Echo Cancellation” box to the right of the device settings screen. If this box is not clickable then you do not need to do anything.

Echo Cancellation

- After making any changes, click the “Save” button.

Adjusting microphone volume

- Click on the small triangle ▲ above the microphone icon to adjust microphone volume level (Figure. 3-32). (for windows only)



Figure. 3-32

- The first time you use the system, unselect “Auto Adjust Microphone Level” on the device settings screen. If your counterpart still finds your sound levels too low after adjusting microphone volume, you can select “Auto Adjust Microphone Level” again.

Auto Adjust Microphone Level

- By clicking on the microphone icon, you can mute/unmute yourself. When you are muted the microphone icon turns red.



Local mute
You can unmute yourself.



Room owner mute
You cannot unmute yourself.

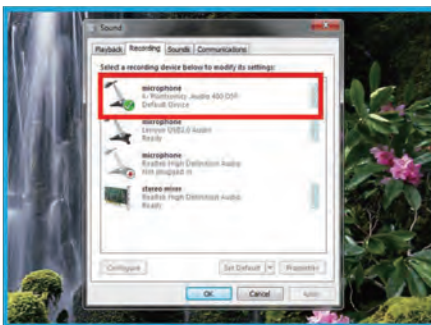
- Always keep your microphone muted when you are not talking.
- If these methods are not working, increasing your microphone level using the “Recording device settings” on your PC (Figure. 3-33).

Adjusting microphone volume

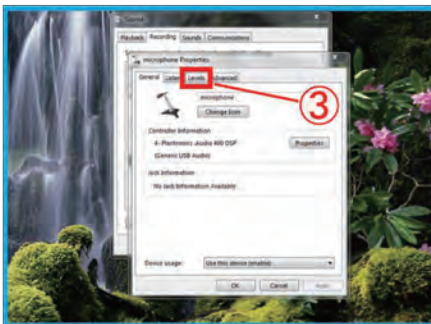


Adjust microphone level from the recording device settings on your PC

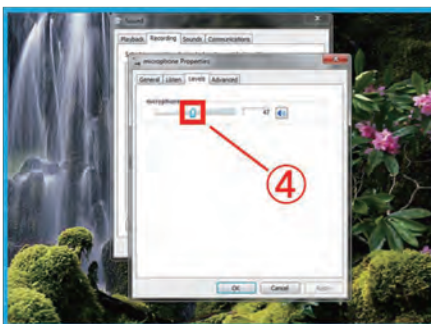
Right-click on the speaker icon at the bottom right-hand of your PC screen ① and select “Recording devices” ②.



Select the microphone you are using from the list of recording devices and double click.



Select the “Levels” tab ③ in microphone properties.



Adjust by dragging the slider ④.

Figure. 3-33 Method for Setting Recording Devices (Windows 7)

6) Sharing presentation materials (e.g. PowerPoint slides)

1 Click on the “Start Sharing” icon ① from the VidyDesktop menu and select your display from the list.



* **Do not select the PowerPoint software from the list of Start Sharing menu.**

2 Once sharing has started, the VidyDesktop window will shrink and the desktop screen will appear. The “Start Sharing” icon will also change to green ③.

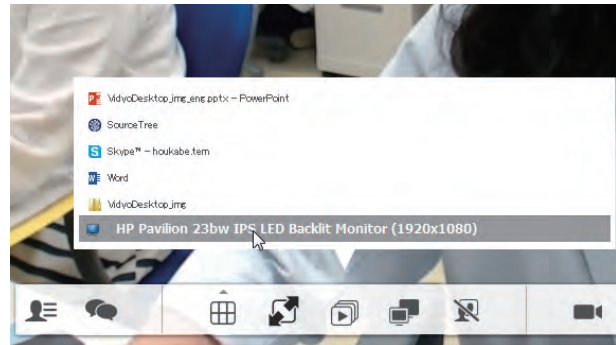


Figure. 3-34

* **Your entire desktop screen will be shared with all conference participants.**



CAUTION

These presentation sharing functions are only for sending images and do not usually include sound. If you want to share materials that include sound, you will need to hook up the sound output from the PC you are using for the presentation to the microphone input on the PC you are using for VidyDesktop.

3

Open your PowerPoint slideshow.

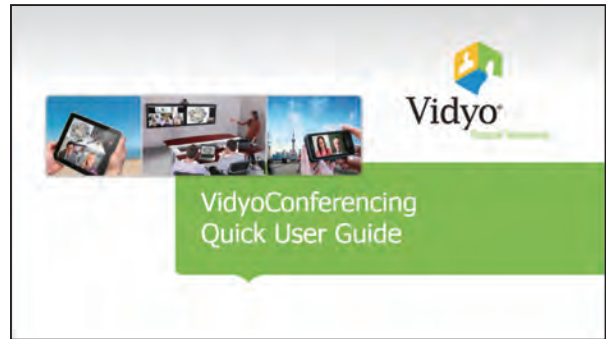
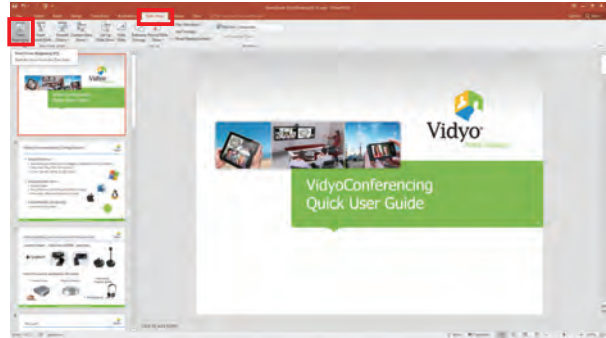


Figure. 3-35

4

To stop sharing your presentation, click once again on the “Start Sharing” icon and elect “**Stop Sharing**” ④.

* Once you stop sharing the VidyoDesktop, window will be restored to full size.

* Once your presentation has finished, be sure to stop sharing your screen.

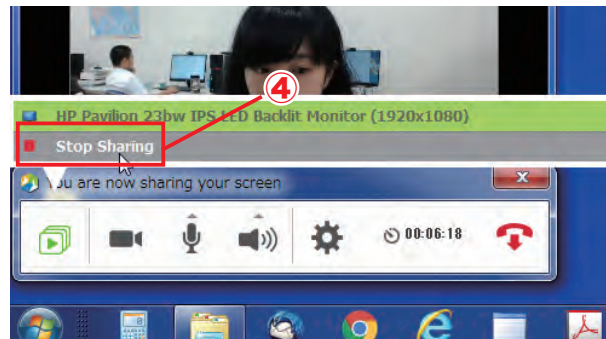


Figure. 3-36

3-2-3. Vidyo streaming

For Vidyo streaming, you need to ensure that you have PC connected to the internet, and audio speaker.

Streaming requirements

OS	Mac OS (10.8, 10.9, 10.10) or later Windows (7, 8, 8.1, 10) or later Android (4.4, 5) or later iOS (7,8) or later
Internet browser	Chrome, IE, Firefox, Safari
Software installed	Adobe Flash Player

1) Open the webcast link URL via your internet browser.

2) If a PIN code is required, insert the PIN code and click the “Watch” button.

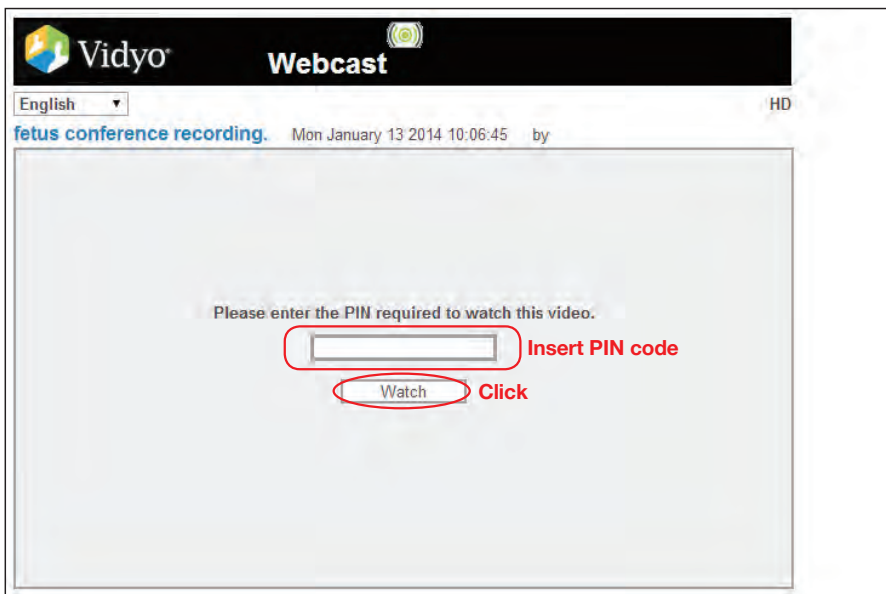


Figure. 3-37 Entry Screen for Vidyo Streaming

* If the webcast hasn't started, the following message will appear. Once the webcast starts, the screen shown in Figure. 3-37 will automatically appear.
(If the screen doesn't change, try refreshing your browser.)

This webcast hasn't started yet. Please wait.

3) Start webcast



Figure. 3-38 Screenshot from a Webcast

- ① Pause/play
- ② Speaker volume
- ③ "Go Live": Play from the current point in the webcast.
- ④ "Pop Out": The play screen pops out from the internet browser.
- ⑤ Full screen view

4) Disconnect

Once the webcast has finished, the image will disappear and you disconnect by closing your browser.

3-2-4. Digital Video Transport System (DVTS)

1) Requirements

PC	2 PCs (1 for sending and 1 for receiving)	
	Windows XP or Windows 7	
	IEEE1394 port fitted on PC for sending (using an extra PC card is possible)	
	Network port with capacity of more than 100Mbps in place	
	Reference specifications	
	OS	Windows XP,CPU:Intel Pentium 4, Celeron or AMD Athlon or later (2GHz or above)
	Memory	256MB or greater
Graphics card	Supports DirectX	
Network card	100 Mbps or greater	
IEEE1394 port	OHCI standard	
Network	30Mbps	
Requirements for sending presentation materials	Analog digital video converter (ADVC)	
	Capability to convert video output from PC to DV signal (IEEE1394)	
	NTSC compatible	
	16bit sound format conversion	
	Devices that have been fully test	
	Canopus Twinpack 100 (no longer in production)	
Roland VC-300HD		
Anycast Station Live Content Producer		

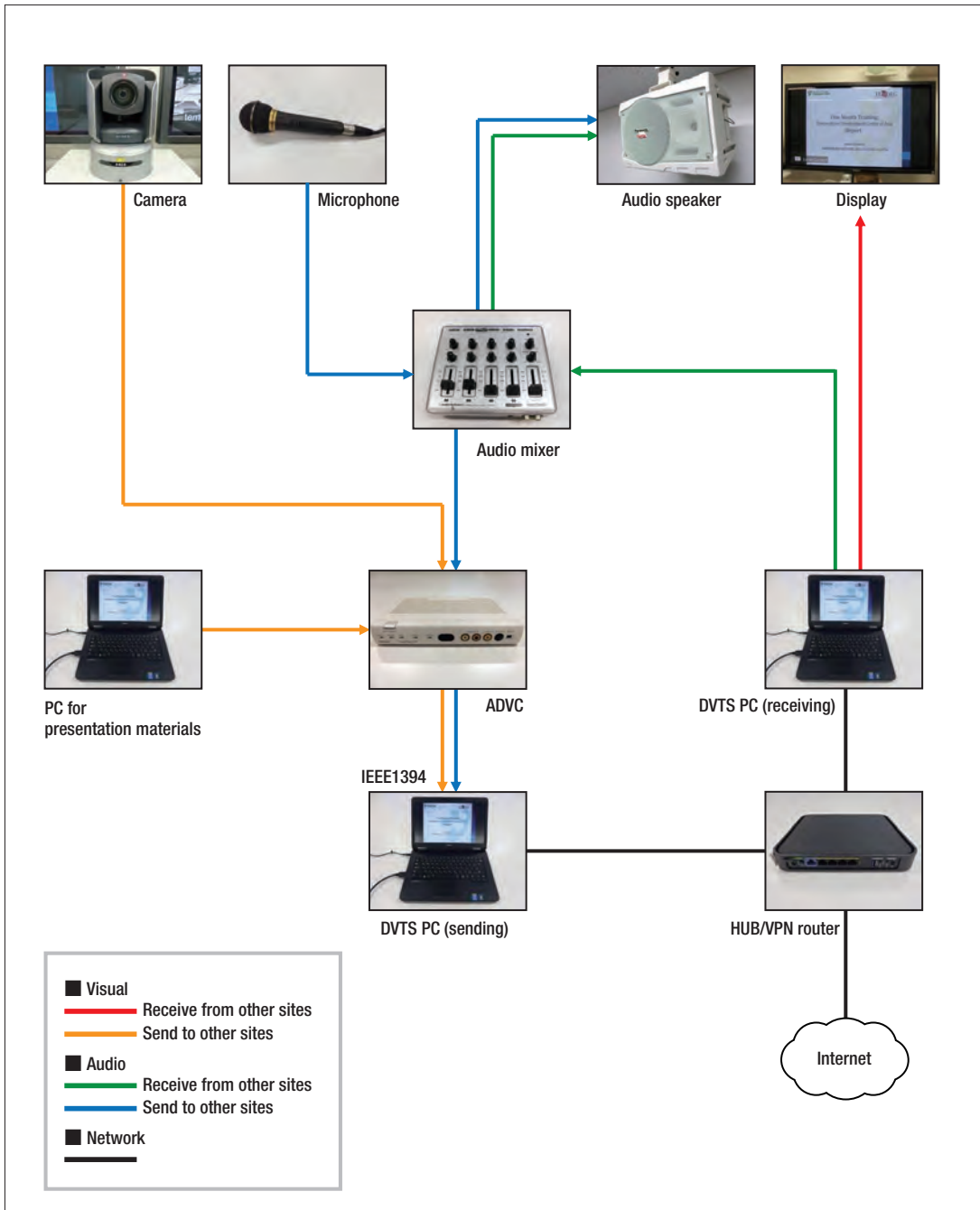


Figure. 3-39 DVTS Equipment Setup

2) How to acquire DVTS software

DVTS software is available online at the following link.

[http://www.sfc.wide.ad.jp/DVTS/software/win2000/DVTS for Windows 0.0.2](http://www.sfc.wide.ad.jp/DVTS/software/win2000/DVTS%20for%20Windows%200.0.2)

“Development build” is the latest version. (as of January 2017)

3) Setup method

1 Install DVTS

Click and run the installer. Follow instructions to install.

Icons like those in Figure. 3-40 will be displayed. You do not need to use the two on the right hand side.

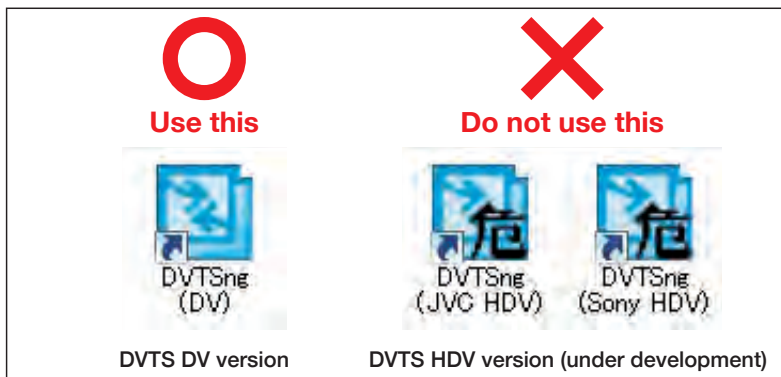


Figure. 3-40

2 When you start the program, the following setup screen will be displayed (Figure. 3-41).

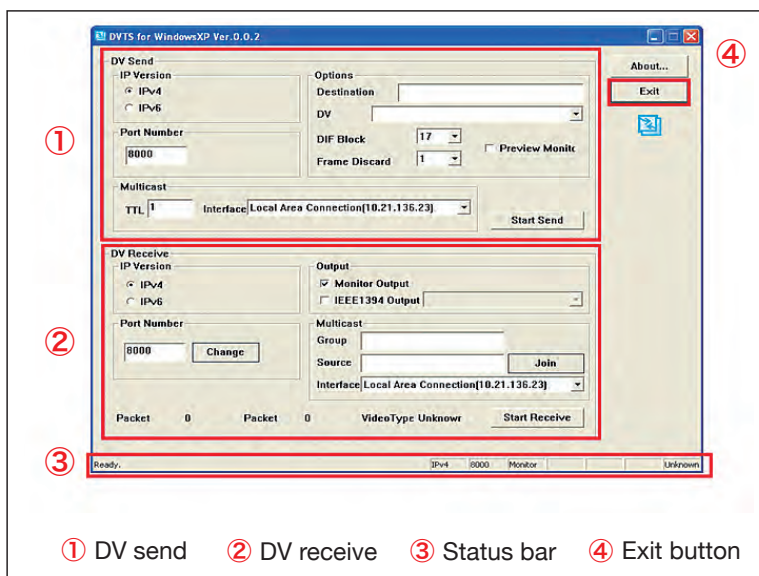


Figure. 3-41 DVTS Setup Screen

3 Settings for sending

The settings screen is as shown in Figure. 3-42.

Normally you insert the destination IP address ④ and select DV equipment ⑤ and check “preview monitor” ⑦ (optional). You then click the “Start send” ⑧ button and transmission will begin. If you have received no special instructions concerning the port number, use the standard “8000.”

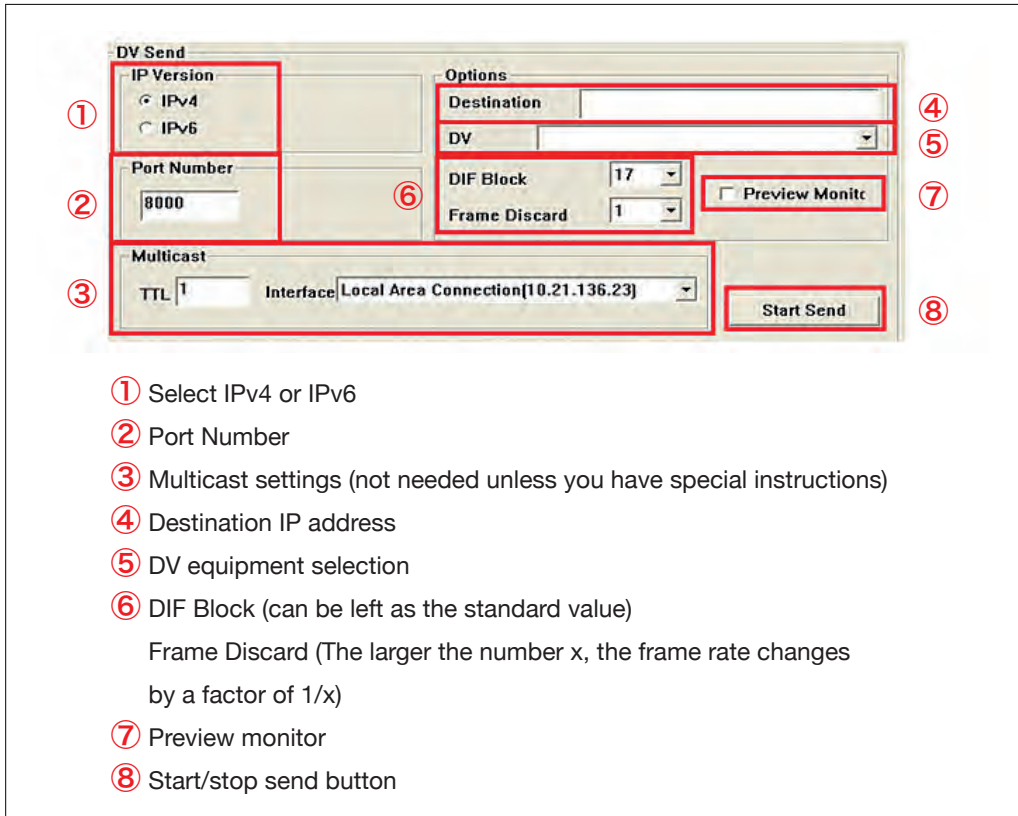
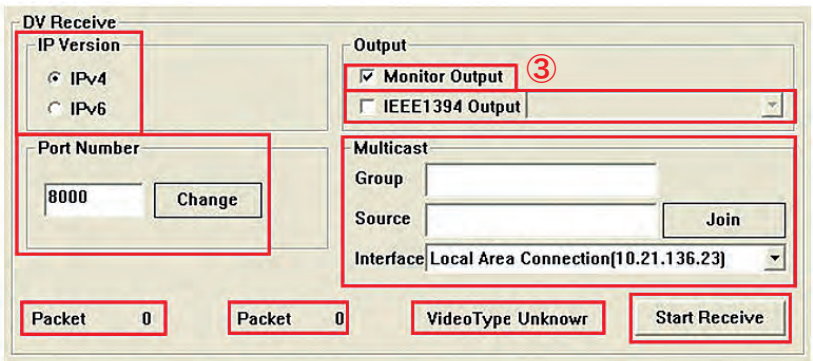


Figure. 3-42 Setup for Sending

Unless DV equipment is correctly connected using DV equipment selection ⑤ and “Start send” ⑧, you will be unable to use the system.

4 Setting for receiving

The setup screen is shown in Figure. 3-43.



The screenshot shows a software interface for DV Receive. It is divided into several sections: 'IP Version' with radio buttons for IPv4 and IPv6; 'Port Number' with a text box containing '8000' and a 'Change' button; 'Output' with a checked 'Monitor Output' checkbox and an unchecked 'IEEE1394 Output' checkbox; and 'Multicast' with fields for 'Group', 'Source', and 'Interface' (set to 'Local Area Connection[10.21.136.23]'), along with a 'Join' button. At the bottom, there are two 'Packet' counters (both at 0), a 'VideoType Unknown' label, and a 'Start Receive' button. Red circles with numbers 1 through 9 are placed around the interface to highlight specific elements.

- ① Select IPv4 or IPv6
- ② Port Number
- ③ Monitor Output (Received images will be displayed on PC screen)
- ④ IEEE1394 output
(Output to DV equipment connected to PC)
* Different equipment from the sending equipment
- ⑤ Multicast settings
- ⑥ No. of packets received (Approx. 2,700 at full frame rate)
- ⑦ No. of failed packets (Packet loss)
- ⑧ Video type (NTSC/PAL)
- ⑨ Start/stop receiving button

Figure. 3-43 Setup for Receiving

Normally, check the “Monitor Output” ③ and click the “Start Receive” ⑨ button to start receiving. If you have received no special instructions concerning the port number, use the standard “8000.” You will need to select IEEE1394 output ④ to extract the images you have received as a DV signal from the same PC terminal. It is necessary to connect DV equipment for both sending and receiving (the same terminal cannot be used for both sending and receiving).

3-2-5. Audio mixer

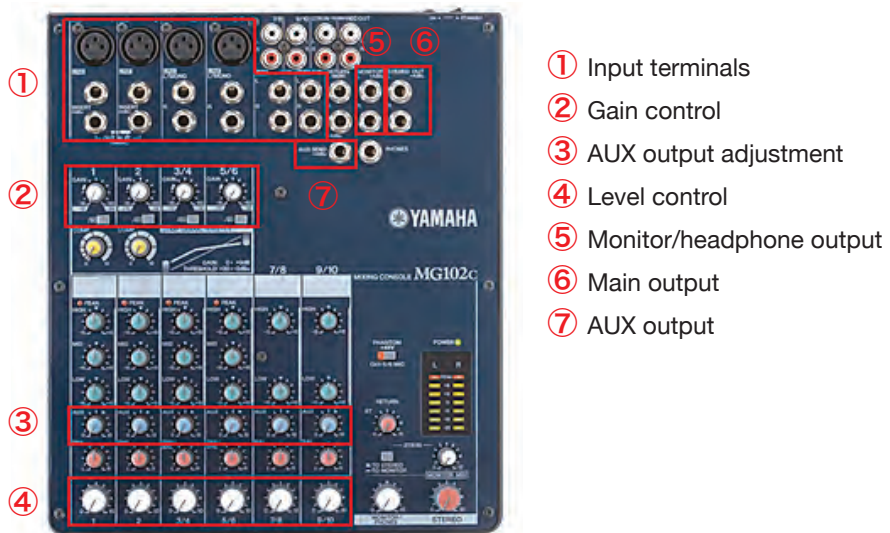



Figure. 3-44 Basic Dials/Sliders on an Audio Mixer (Yamaha MG102C used for illustrative purposes)

<p>① Input terminals</p>	<p>The image to the right (Figure. 3-45) shows an XLR input terminal above and a TRS phone-type input terminal below. If the mixer is close by (within 1-2 m) you can use either type, but if you are concerned about noise it is best to use XLR. Also, if you are using a condenser-type microphone, unless you connect XLR connector cable you will not be able to get power to the microphone.</p>	 <p>Figure. 3-45</p>
<p>② Gain control</p>	<p>This may be labelled as “Trim” on some devices, and size differs depending on the type of input signal. If you increase this too much, sound will become distorted. It will also result in peripheral sounds being picked up, which could cause echo.</p>	
<p>③ AUX output adjustment</p>	<p>This is used to adjust the sound output level from AUX Send. This output level is affected by the level control in ④.</p>	
<p>④ Level control</p>	<p>This is used to control the output level of all input channel signals and adjust volume balance between channels. In order to reduce noise, the level control is turned down for channels that are not being used.</p>	
<p>⑤ Monitor/headphone output (Mainly headphone, etc.)</p>	<p>This is used to output a level-adjusted mixed signal from the MONITOR/PHONES control on the master control section of the control panel.</p>	
<p>⑥ Main output (Speaker output, etc.)</p>	<p>This is used to output level-adjusted STEREO from the master control section of the control panel.</p>	
<p>⑦ AUX output (sending sound, etc.)</p>	<p>This is used to output the EFFECT(AUX) signal (adjusted in ④).</p>	

Chapter

4

Venue Setup

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Authors ● Tohru KONDO, Takashi KIMURA,
Itsuko ASADA, Masayuki KOBAYASHI

Chapter 4

Venue Setup

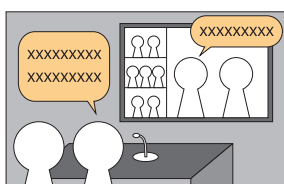
The venue where you hold telemedicine conference will be seen and heard by other venues. There are also various points to bear in mind when using teleconferencing systems. In this chapter we cover the key points relating to the venue setup for a telemedicine conference.

KEY POINTS

	Listening/ watching only	Participating in a conference	Making a presentation
	★ ★ ★	★ ★ ★	★ ★ ★
Conference operation			
● Decide on a secondary means of communication with the conference host	✓	✓	✓
● After implementing a connectivity test always use the same setup and means of communication	✓	✓	✓
Venue selection			
● Set up equipment in way that matches the layout of the actual venue	✓	✓	✓
● Check the location of power sockets and network equipment	✓	✓	✓
● Reserve the room for both preparation and the day of the conference	✓	✓	✓
Venue setup			
● Apply the latest security patches and updates to all computers being used	✓	✓	✓
● Check power options on equipment and disable any “power-saving mode” functions	✓	✓	✓
● Position equipment and power lines in an unobtrusive way, considering lines of flow in the venue	✓	✓	✓
● Adjust display, camera and microphone to ensure natural conversation		✓	✓
● Send presentation files to all venues in advance			✓



★ ★ ★
Listening/watching only



★ ★ ★
Participating in a conference



★ ★ ★
Making a presentation

4-1. Conference Operation

When operating a teleconference, be sure to confirm the following items with the host (your conference counterpart) in advance.

1. Program outline (small conference/seminar/big symposium)
2. Number and details of participants
(Point-to-point connection/multi-point connection)
3. Is there a time difference or a need for interpretation
(for conferences with overseas counterparts)?
4. Equipment to be used
5. Positioning of desks and microphones
6. Schedule a connectivity test
7. Responsibility for venue setup and division of roles on the day of the conference
8. Emergency contact details or response measures if trouble occurs
9. Whether presentation materials going to be used or not

It is important to confirm in advance emergency contact, in case trouble occurs. It is important to be able to inform your conference counterpart, either by phone, chat tool or text message, etc., if there is sudden equipment failure or network trouble that causes your connection to drop. It is a good idea to acquire a Skype ID as a secondary means of communication and test this out at the same time as the conference connectivity test to ensure that you have a backup means of communication if all else fails. Skype can also be used not just as a means of backup contact, but can also work as an emergency replacement system if equipment goes down. You should always have a separate PC with Skype running in addition to the PC you are using for the teleconferencing system.



4-2. Venue Selection

When selecting a venue for a telemedicine conference, you will need to take into account various points that are different from a local meeting, including the teleconferencing system, network equipment, etc. Basically, there may be slight variations depending on the conference program, the main points for selecting a venue are detailed below.

1) Reserving a conference room

Although the size of the room you require will depend on the number of participants and the scale and type of participation, you will need a room that is approximately two-to-four times larger than a room you would use for the same number of participants in a local meeting. You will need to do connectivity tests in advance and also directly before the conference starts, so it is important to confirm a test schedule with your conference counterparts and reserve the conference room in plenty of time to allow for these tests. While it is preferable to leave the equipment in place after performing an advance connectivity test, if you are unable to leave everything in situ until the main conference, you will need to set up the room and equipment at least twice – once for the test and once for the main event. On the day of the conference you should plan on doing an advance test between 30 minutes and two hours prior to the main conference.

2) Check the network environment and equipment

You should check the conference room for power and network sockets and ensure a usable network is also in place. Although computer-based teleconferencing systems may work on a wireless network, it is always better to connect to a wired network to ensure sufficient communication speed and stability.

Details about preparing the network environment can be seen in **Chapter 2-2**.

One of the important points when selecting a venue is connectivity between the teleconferencing system equipment you will be using and other devices.

You should check the following equipment.



Figure. 4-1 network sockets (left), Power socket (right)

● Audio equipment	Microphone, audio speaker, audio mixer
● Visual equipment	Camera, display, monitor, converter
● Connectivity with teleconferencing system	Checking for echo, connector format, impedance value, checking image clarity (resolution, brightness, frame rate)
● Lighting	Sufficient light for the camera to work effectively
● Air conditioning and ventilation	Ensure appropriate temperature and also that ventilation system is not picked up by microphone

3) Positioning of equipment

Conference setup and operation will run smoothly if you select a room while giving thought to the positioning of equipment, after checking the size of the conference room and the location of power and network sockets. If you check beforehand the room acoustics, positioning of audio speakers and lighting, and whether there are any extractor fans or similar ventilation equipment that make a noise, this information will be useful when adjusting sound and deciding where to place chairs and tables.

As you can see, although the various tools and equipment may differ slightly depending on the kind of conference you are holding, it is very important to get information about the room you will be using as your venue and what teleconferencing system you will be using, and convey this information to the conference host beforehand. You should also bear in mind that depending on the situation it may be necessary to limit the number of participants or seek an alternative venue.

4-3. Venue Setup

Once the venue has been decided, you will be conducting a connectivity test with your teleconferencing counterpart. It is a good idea to do a rehearsal, using exactly the same format and setup that you will use on the day of the conference. Here we share some of the main points about setting up a venue.

1) Preparing equipment and furniture

Electric power is vital for all equipment, so you will need to ensure that the power supply is stable and uninterrupted. For computers, you should go to the “Power Options” settings and disable power-saving mode, so that the PC does not switch off during the conference. You will also need to ensure that the latest security patches and updates have been applied to your PC. By fully updating your PC you will avoid communication degradation by automatic updates. During your conference. If possible it would be a good idea to have a backup PC available in the room, which you can use to contact your conference counterpart or respond to issues when they should rise.

In addition, it is necessary to display a signboard or banner showing your institution. It is best to prepare a sign on which a short name or phrase is written in large letters. An easily recognized logo would be ideal and reflective materials should also be avoided (Figure. 4-2). A large and identifiable sign helps to improve recognition among multiple bases in a conference when multiple screens are being used simultaneously (Figure. 4-3).



Figure. 4-2 Good Signs Example (left), Bad Example (right)



Figure. 4-3 Ways to Display Signs when Using Multiple Screens Simultaneously

2) Positioning of equipment

When conducting your pre test of equipment it is important to set up desks and chairs, etc., in the same format as for the main conference. This will help you to confirm the flows of people in the room and check the sound quality. Power and network cables can cause accidents by people tripping or stepping on them. To avoid such accidents, you should cover any exposed cables using masking tape or other means.

On many occasions you will need to concentrate on making minor video and audio adjustments during the main conference, meaning that it will be difficult to respond to any other issues quickly once the conference has started. Ideally it is best to leave the room set up unchanged from the time of the advance test until the time of the main conference. However, if this is not possible it would be useful to take photographs of the test setup and use these photos to recreate the same setup on the day of the main conference.



3) Points of caution about images/lighting and sound

Images/lighting and sound are important for a teleconference. You will set up a display or screen of a size appropriate for the number of participants and conference content in order to show video and images. Even if your conference is only for a small number of people, the use of a large display or screen will boost the sense of interaction and participation. In all cases, it is essential for the room to be brightly lit. If your room has ceiling lights only, you should arrange seating to reflect participants' faces are well lit and visible.

The positioning of the screen/display and camera are also important. As participants focus their gaze on the center of the screen if you set your camera at the same height it will mean that the people in shot will be at the same eye level as the camera, facilitating natural conversation with your counterparts. However, if you place the camera exactly at eye level it can obstruct the screen (Figure. 4-4 (left)). It is usually the case that the camera is positioned either above or to the side of the screen, depending on the format of the screen or participants' wishes. What is important in this case is to give thought to the positioning of the camera so that the eye line of the participants being videoed does not seem too unnatural for other people watching the image (Figure. 4-4 (right)).

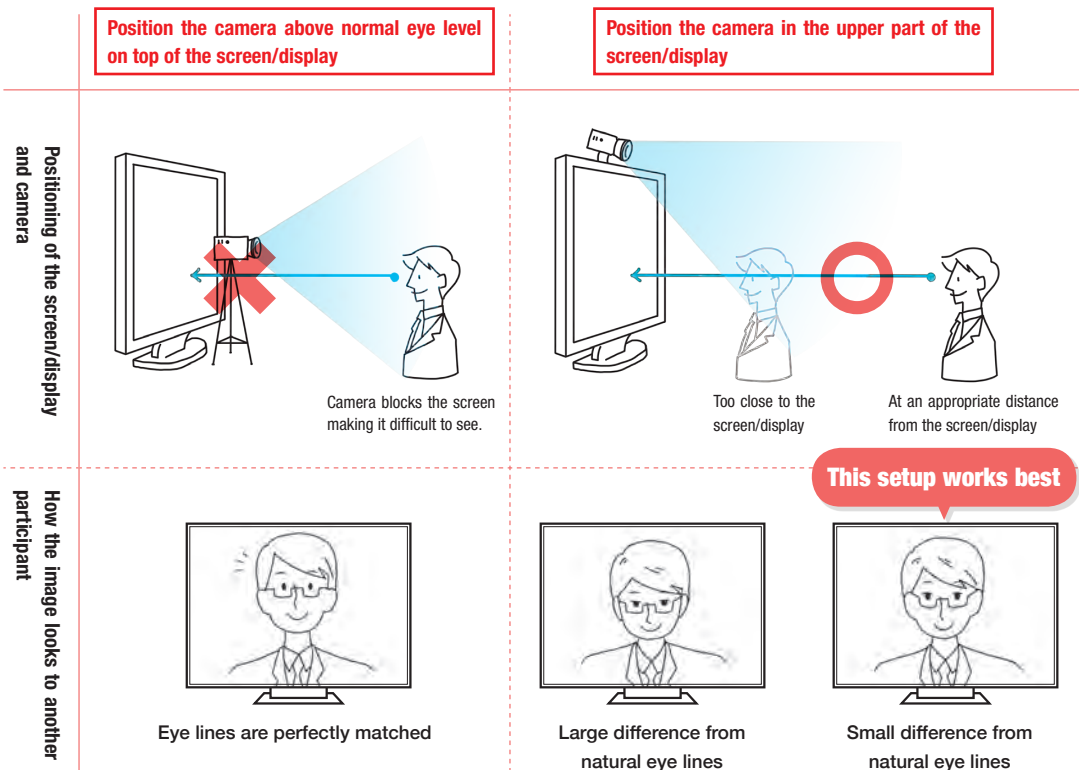


Figure. 4-4 Positioning of Display and Camera and How Your Counterpart Sees Your Image

If you are using pre-installed and fixed sound equipment, it will be essential to take care when positioning the equipment and microphones to prevent howling, echo and noise. In particular, if the microphones and audio speakers are separate, you should take care that the end of the microphone does not point directly at the audio speakers. Some microphones for teleconferencing can be unidirectional, meaning that they are designed to pick up sound from a specific direction to optimize the sound input. These microphones are very sensitive to sound directly in front of them and they may pick up sound from audio speakers, even those placed a long distance away, if pointed directly at them, which will cause noise or echo.

Further details about sound equipment can be found in **Chapter 3-1-3**.

If you are using a projector, it is also necessary to ensure that the microphone is not brought too close to the projector. Particularly in the case of speakerphones, which are omnidirectional and pick up sound from 360 degrees, it could be that the sound of a projector fan will be picked up, which would create faint whirring background noise. An example of this is shown in Figure. 4-5.

You should also bear in mind other potential sounds and noises, such as ventilation and air conditioning systems.

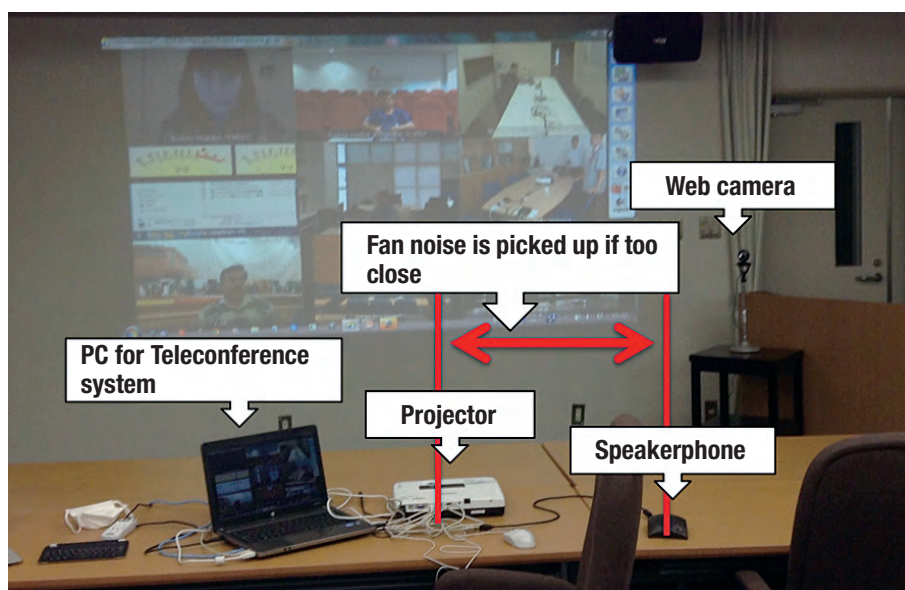


Figure. 4-5 Example of a Projector and Microphone (speakerphone) Place too Close Together

4) Check Points during pre test

During pre test, please be sure to check how your camera is working by using “self-view”. A self-view test means that the image you are filming on the camera is being looped back through your PC, and it may appear differently to how it will appear to conference counterparts. However, a self-view test is useful for checking if your camera is working.

It is not possible to check yourself how your sound is received and heard by another site. Therefore, adjusting sound from your site becomes particularly difficult. The basic principle is to make sure your microphone is muted (off) at all times other than when you are talking. It is always preferable to be able to switch off the microphone from the hardware equipment, rather than via an application. So that you will be able to make adjustments in the main conference make sure you decide where to place equipment and operators at the time of the pre test.

Another important test is sharing presentation materials if you are making a presentation from your site. If the presentation slides were created on a Mac-based PowerPoint program, there may be cases where they do not display properly on a Windows-based system. If your presentation includes movie files, you will also need to check that the movie can be viewed without being corrupted. If the movie you send is unclear or fails to play smoothly, you will need to consider having the movie shown locally in all connecting venues. For this reason, it is essential to distribute presentation materials in advance and ensure that all images can be viewed in all venues.

You will need to position computers so that they can be operated by engineers. For this reason it is a good idea to provide a USB-connected keyboard for the engineer, so that he or she can still engage in operations if the PC is being used by the presenter. Also, if presenters are not accustomed to control PC, the safest option is to have the engineer perform operations in sharing presentation materials. To ensure a failsafe conference we recommend having a minimum of two (audio and visual), or ideally three (audio, visual, backup contact engineers).



5) Other points about venue setup

If you are able to change the positioning of desks and chairs in your conference room, we suggest that you change the layout to best match the type of teleconference you will be having. For seminars, lectures and symposiums, where there will be a relatively large number of participants, the optimum layout is the “schoolroom” style, where desks and chairs are lined up and forward-facing. For a conference including local discussions it is best to arrange the desks in a “U-shape” so that everyone can see each other. For a small-scale meeting a single row of desks will be ideal. In special situations like a panel discussion you can set up the camera in the rear of the room so that the panelists can all be seen as if they were facing an audience. Examples of venue layouts are shown in Figure. 4-6.

For seminars, lectures and symposiums with large numbers of participants, it may be necessary to distribute a guide map to the venue. Such a map should include the main access routes to the venue and a diagram of the surrounding area. To avoid confusion on the day of the conference it would be useful to include information on lavatory locations, and, depending on the time, the location of cafeterias or stores where food and drink can be purchased. This map should be distributed in advance and it is also effective to have a map pinned up in the conference room itself.

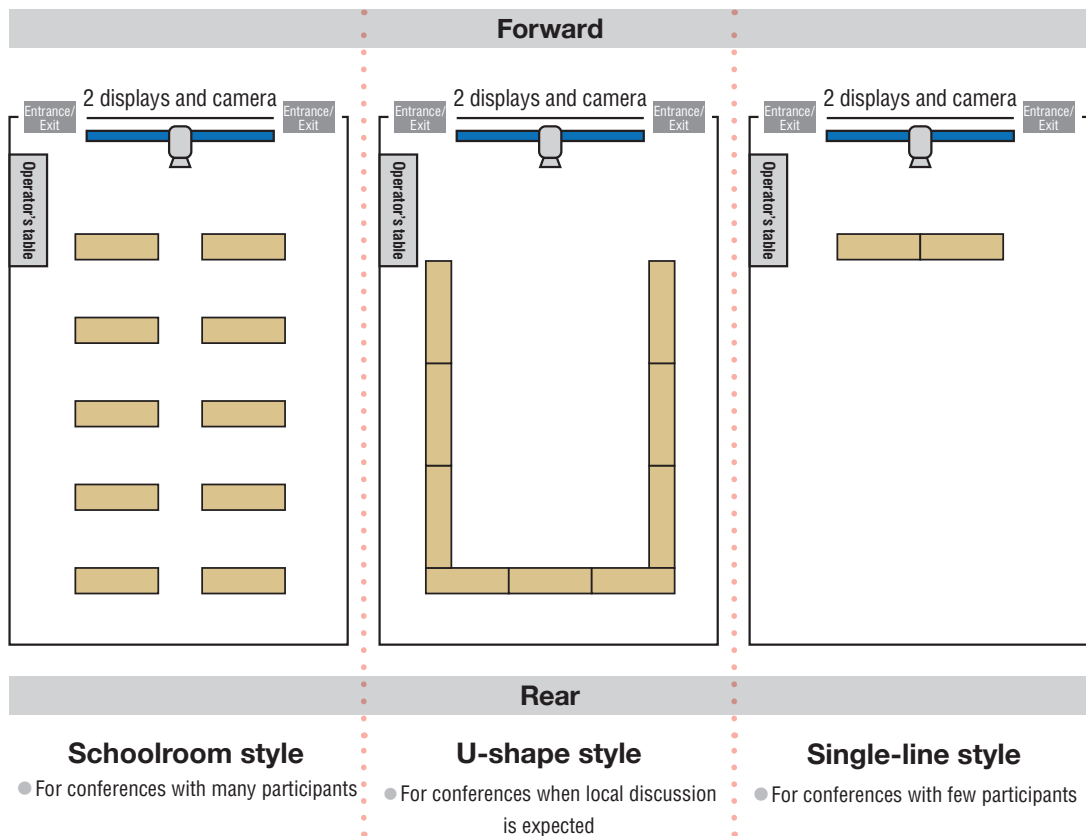


Figure. 4-6 Examples of Venue Layouts

Chapter

5

Points to Note During the Conference

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Authors ● Tohru KONDO, Takashi KIMURA,
Itsuko ASADA, Masayuki KOBAYASHI

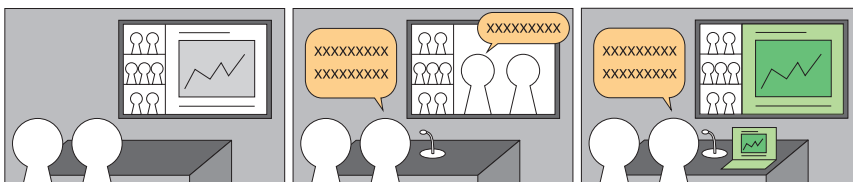
Chapter 5

Points to Note During the Conference

No matter how good your preparations and thorough your pre-testing, there will be times when accidents occur during the actual conference. Particularly when the conference is connected with many institutions, it is difficult to predict what troubles will occur. In this chapter, we provide points about how to prevent such trouble, or how to minimize its impact if it occurs.

KEY POINTS

	Listening/ watching only	Participating in a conference	Making a presentation
	★ ★ ★	★ ★ ★	★ ★ ★
Directly before the conference			
● Prepare a check list beforehand	✓	✓	✓
● Notify participants that you will take photographs of the conference	✓	✓	✓
During the conference			
● Adjust the volume on audio frequently to ensure easy listening	✓	✓	✓
● Photographing during the conference	✓	✓	✓
● Mute all microphones unless talking		✓	✓
● Ensure constant communication between engineers using chat tools etc.		✓	✓
● Stop sharing materials as soon as the presentation is over			✓
After the conference			
● Dismantle equipment and restore the room to its original state	✓	✓	✓



★ ★ ★
Listening/watching only

★ ★ ★
Participating in a conference

★ ★ ★
Making a presentation

5-1. Directly Before the Conference

If you have dismantled equipment between the pre test, you will need to set up equipment again on the day of the conference. If pre-tests were conducted, there should be no problems. However it is best to do one last connectivity test directly before the conference starts. We recommend that you conduct final checks, including the volume of the audio speaker in the venue, how the image of your own site appears and your microphone volume for transmitting. You should also reconfirm communication methods between connecting institutions if trouble occurs.

Also, if you are going to be sharing a presentation from your own site, be sure to check the operational status of the PC you will be using before the presentation begins.

By telling conference participants that they will be constantly visible on screen to other participants in other locations, you need to enhance their awareness that this is a live teleconference with other remote participants. If you will be taking photographs of the conference for the purposes of creating a record, you also need to tell participants about this.

Points to note before the conference starts

- **Communication status**
- **Volume level on audio speaker**
- **How your image appears in the other connecting institutions**
- **Microphone volume for transmitting**
- **Operational status of presentation PC**
- **Explanations to conference participants**



5-2. During the Conference

Once the conference has started the engineers will ensure that on-screen images can be seen clearly and adjust volume level of your audio speaker. There are times when the volume from other connecting institutions may be louder or more quiet than it was in the pre test. To respond to this issue, you need to adjust the volume level of your audio speaker to ensure that all speakers/presenters' voices are at a balanced volume. Conversely, if the sound from your own sites is too quiet, you will need to boost the volume. As the appropriate volume level of the speaker/presenters' voice will frequently change

depending on the volume level of your audio speaker or the position of the microphone. Therefore, it is recommended to have the engineer specialized in charge of adjusting the volume level of your audio speaker.

The standard practice for a teleconference is to mute your microphone when you are not speaking. The reason for this is not just to prevent noise and echo, but also to facilitate the conference by eliminating any unnecessary conversation. The microphone mute can be switched on and off directly from the microphone by the speaker, or it can be operated by the engineer from the main operating console. It is a good idea to alternate between these two options, depending on the type of conference. For example, when speakers are frequently engaged in conversation, it is best to use the on-off switch of the microphone mute. When there is less talking such as a seminar, it is best to let the engineer operate mute from the console until the Q&A session, at such time use the on-off switch of the microphone.

Alternatively, when you are making a presentation from your own site, it is best to stop sharing the materials as soon as the presentation ends. By doing this you will not only prevent keeping transmission of your image, but also avoid unnecessary data traffic and enhance communications stability.

In addition, in the same way as for the pre test, it will be useful for the engineers at various connecting institutions to use a chat tool like Skype to keep in touch and ensure the conference proceeds smoothly.

We also recommend that you take photos of your conference. If these photos are inserted in the report of the conference they will form a useful source of reference for future conferences and will help you to identify any errors or mistakes in the future.



Points to note during the conference

- **Communication status, Noise on picture/video**
- **Volume level of your audio speaker, and noise**
- **Microphones muted**
- **Stop sharing materials after the presentation ends**
- **Maintain close contact between engineers at connected institutions**
- **Take photographs as a record of your conference**

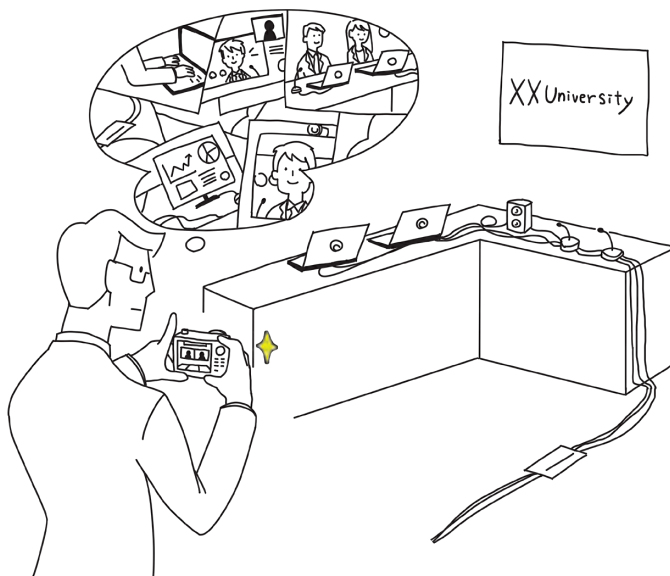
5-3. After the Conference

Once the conference has ended, you will dismantle your equipment and restore the venue to its original state. If you have changed the settings on the computers you have been using, you should return these to their original settings also.

By keeping a record of your conference, you can use it to identify issues in future conferences. With the understanding of the participants and the host, photos are also a useful way of keeping a record of the conference if required. In particular, photos of the entire conference room, the screen and the equipment set up give a clear picture of the atmosphere and communications style and conditions that will be useful when planning further conferences.

Points to note after the conference

- Dismantle equipment and restore the venue to its original state
- Make a record of the conference by taking pictures



Chapter



Troubleshooting

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Chapter 6 Troubleshooting

In this chapter, we explain how to respond to trouble that may occur during a telemedicine conference. The chapter is divided into three sections that detail the main methods for dealing with problems relating to sound (**Chapter 6-1**), images (**Chapter 6-2**) and networks (**Chapter 6-3**).

6-1. Sound Problems



Echo/Howling

→ Main causes

- The microphones are picking up sound from the audio speakers because they are positioned facing each other.
- Engineers at the venue causing the echo do not realize an echo is occurring (the echo is only heard at other sites, not the source) (see p. 48).

→ Solutions

- Reduce audio speaker volume.
- Reduce the microphone input level and ask presenters to move closer to the microphone.
- Take distance between audio speakers and microphones (see p. 82).
- Adjust the directions of the audio speakers and the microphones to ensure they are not facing each other.

- Inform the venue that is the source of the echo.
- Use echo-cancelling equipment if available.
However, if using echo-cancelling equipment, make sure the software-based echo-canceller (on VidyoDesktop, etc.) is switched off and not use together (Figure. 6-1) (see p. 61).

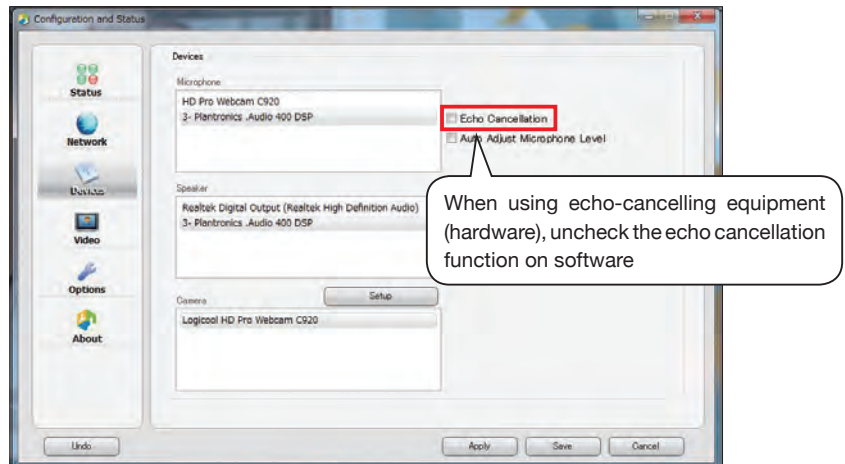


Figure. 6-1 VidyoDesktop Settings Window

- Use a headset (if there is only one participant in the conference).
- Provide earphones to all participants (if the conference room is small).
- Change the microphone to a unidirectional type (see P. 47).

Noise

➔ Main causes

- Sound of ventilation/air-conditioning equipment in venue is being picked up by microphones.
- Constant underlying noise from equipment (microphones, mixer, cables, etc.) is being amplified and transmitted to conference counterparts.
- Equipment that is not usually in operation (fax machine, etc.) is suddenly switched on.

➔ Solutions

- Minimize the sound of equipment like air-conditioning units in the venue (e.g. reduce the fan speed/air flow).

- Reduce the microphone input level and ask presenter to move closer to the microphone when talking.
- Confirm the location of other equipment like fax machines, and position microphones so that they will not pick up any sound from the operation of such equipment.
- Change microphones to ones better suited to the venue (see Chapter 3-1-3).

Sound breaking up

➔ Main causes

- Input volume is too large.

➔ Solutions

- Reduce the microphone input level (see p. 61).
- Set up equipment so that "Auto Adjust Microphone Level" function is not used (Figure. 6-2).

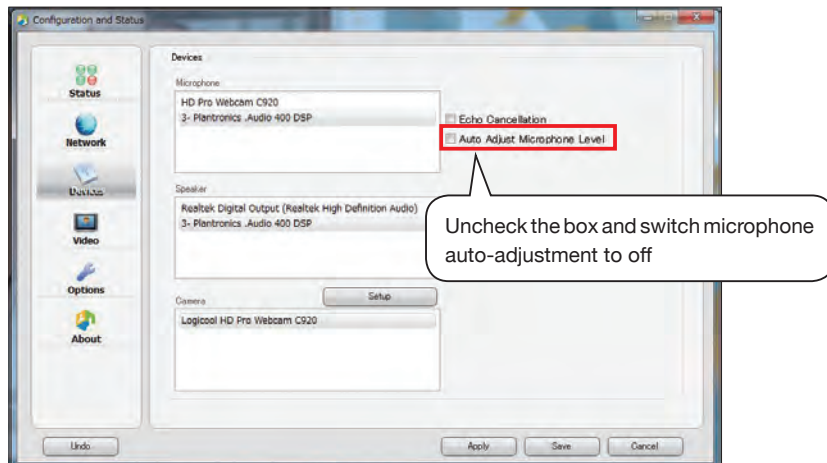


Figure. 6-2 VidyoDesktop Settings Window

- If using a audio mixer as part of your equipment setup, reduce the input volume on devices that are closer to the microphones.
- Make sure that the audio mixer output is not inserted in the LINE IN terminal on the PC, but in the MIC terminal.
- Ask presenters to not get too close to the microphone when talking.



Your sound cannot be heard by counterparts

→ Main causes

- ⦿ Problems with sound input cable connection or equipment settings.

→ Solutions: Confirm the following points

- Is the microphone switched on?
- Is the sound cable connected?
- Is the sound cable inserted in the correct terminal?
(e.g. Confirm that the microphone and audio speaker terminals are not inserted the wrong way around.)
- Has the sound cable been cut/disconnected?
Note: Confirm by replacing the sound cable.
- Is the microphone level too low?
- Is the microphone level too high, causing sound to be cut?
- Do not use the microphone auto-adjust function.
- Are the sound settings muted on any of the devices in the setup?
(e.g. Confirm that the speakerphone mute is not switched on)
(Figure. 6-3).



Figure. 6-3 Speakerphone Mute Switch

- Are any software sound settings on Vidyo, etc., set to mute?
(e.g. Figure. 6-4)

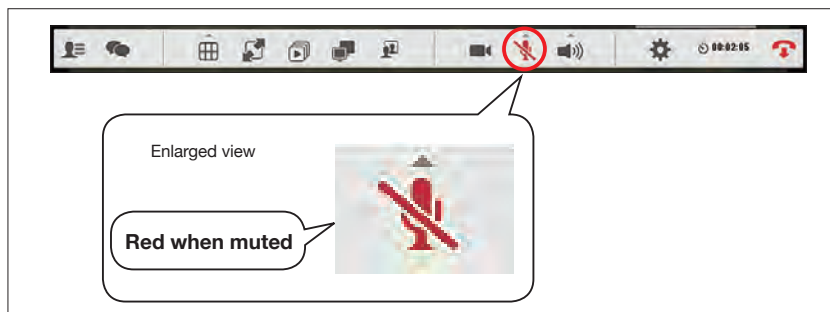


Figure. 6-4 VidyoDesktop Status Control Bar (red when muted)

- Are the sound input settings all correct?
(e.g. Check that they are set for external input.)
- Can the others hear the sound?
Note: If only one or two cannot hear your sound, it is likely that the cause of the problem is at one of the other (receiving).



Unable to hear sound from other participants

→ Main causes

- Problems with sound output cable connection or equipment settings.

→ Solutions: Confirm the following points

- Are the audio speakers switched on?
- Is the sound cable connected?
- Is the sound cable inserted in the correct terminal?
(e.g. Confirm that the microphone and audio speaker terminals are not inserted the wrong way round.)
- Has the sound cable been cut/disconnected?
Note: Confirm by replacing the sound cable.
- Is the audio speaker level too low?
- Are the sound output settings all correct?
(e.g. Are they set for external output?)

- Can other sites hear the sound?

Note: If other sites are also unable to hear sound, the cause of the problem may be at the transmitting base.

- In the case of simultaneous interpretation, the speaker or the interpreter's sound may be single-sounded output (mono), so you will need to confirm with the host.
- Switch the echo-canceller off on VidyoDesktop.



Unstable sound volume

→ Main causes

- Problems with sound output cable connection or equipment settings.

→ Solutions

- If audio speakers are battery powered, change the batteries.
- Switch off the echo-canceller.
- Confirm the situation at other sites.
- Refer to the sections above on “[🔊 Your sound cannot be heard by counterparts](#)” and “[🔊 Unable to hear sound from your counterparts.](#)”



Sound is difficult to hear

→ Main causes

- Problems with sound output cable connection or equipment settings.

→ Solutions

- Volume exceeds audio speaker output capacity.
- Switch off the echo-canceller.
- Confirm the situation at other site.
- Refer to the sections above on “[🔊 Your sound cannot be heard by counterparts](#)” and “[🔊 Unable to hear sound from your counterparts.](#)”



Communication methods when sound trouble occurs

➔ Preparing alternative means of communication in place if sound trouble causes communication failure.

- Prepare a chat tool such as Skype to ensure you can always stay in contact with counterparts.
- Decide hand signs or gestures in advance and use these in front of the camera (Figure. 6-5).

Note: Make large gestures using your body that will be easy to understand even on a small screen.

Note: Be aware that hand gestures have different meanings depending on country and culture (and could be offensive to some people)

(e.g. While in Japan making a circle with your thumb and forefinger means “OK”, in France it means “zero” or “incompetent” and in Brazil it means “I am a dangerous person” or “anus”).



Figure. 6-5 Communication Using Gestures
I can hear (left), I cannot hear (right)

- Use paper, whiteboard or the PC text input screen to write and convey written messages (Figure. 6-6).

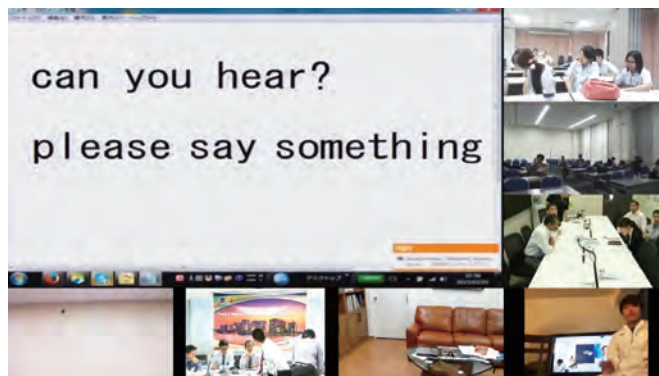


Figure. 6-6 Communication Using Text Messages When Trouble Occurs

6-2. Image Problems



Poor image quality

→ Main causes

- The resolution on the receiving equipment is set to auto-adjust.
- The projector is projecting an image at a lower resolution than the one received.
- The original resolution of the sent/received image is low.

→ Solutions

- If the resolution of the receiving equipment is set to auto-adjust, it may project an image at a low resolution. If you feel that picture quality is poor, check the resolution.
- Even if a projector is UXGA compatible (1600×1200), it may automatically drop the resolution to XGA (1024×768) when projecting. You should check your equipment to see if this is the case.
- Confirm picture quality at other sites participating in the teleconference.



Image does not display

→ Main causes

- Problems with video cable connection or equipment settings.

→ Solutions: Confirm the following points

- Is the monitor or the projector switched on?
- Is the video cable connected?
- Has the video cable been cut/disconnected?

Note: Confirm by replacing the video cable.

- Is the sound cable inserted in the correct terminal?

(e.g. Output device:

Is it inserted in the PC input terminal?

Video viewing device:

Is it inserted in the output terminal of the monitor or projector?

(Figure. 6-7))

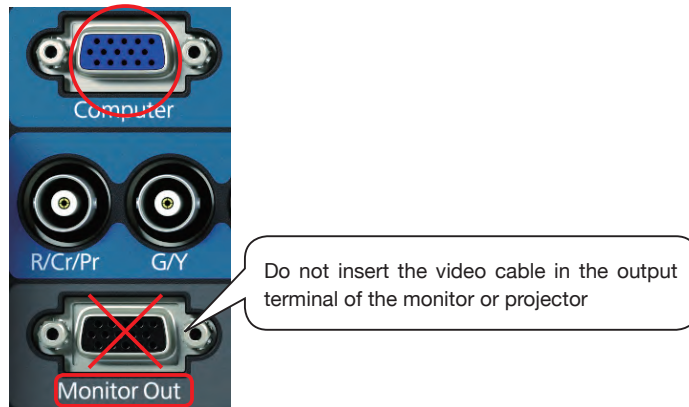


Figure. 6-7 Examples of Projector Output Terminals

- Does the selected input source for the monitor or projector match with the cable connected to the device receiving the images?

(e.g. Check if the projector input source is set as VGA when you are actually connecting with a HDMI cable, etc. (Figure. 6-8))

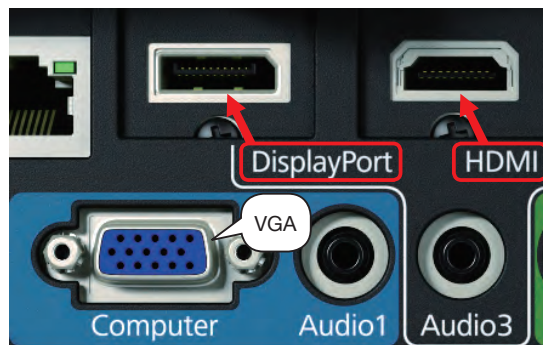


Figure. 6-8 Example of Projector Video Input Terminals
From top left: DisplayPort, HDMI, VGA

- If you are using a laptop PC to receive images and output them to a projector, check that the output is set correctly for the projector (Figure. 6-9).

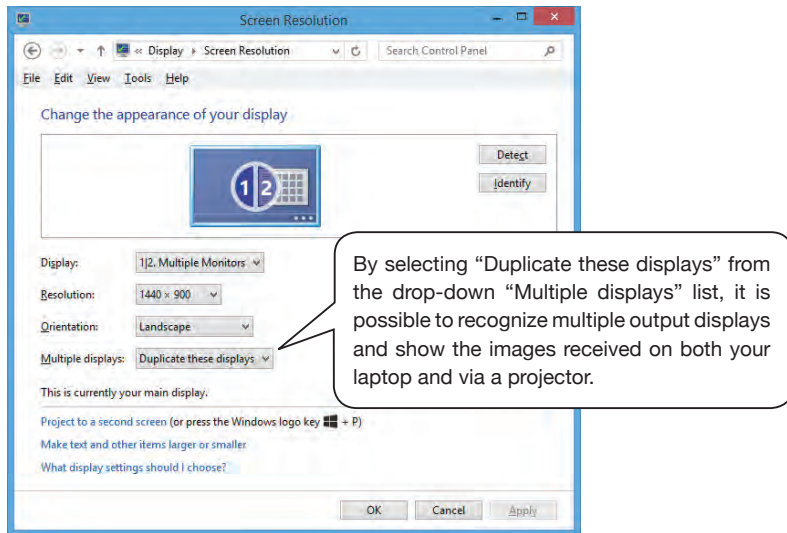


Figure. 6-9 Windows8 Output Setup Screen

- Check whether the output resolution to the projector is compatible with the resolution of the projector.
- Confirm whether other sites can see the images
Note: If other sites cannot see the images, the problem may be caused on the sender's side.
- Can you hear sound?
Note: If you cannot hear anything, it is possible that all communication has dropped.



Image noise/fuzziness or broken images

➔ Main causes

- Connection speed has dropped or the network disconnect.

➔ Solutions

- Refer to “[Packet loss](#)” in Chapter 6-3 on Network Trouble.



Unable to share presentation materials (presentations are not shown on screen)

➔ Confirm the following items depending on the type of teleconferencing system you are using

➔ If using VidyoDesktop

- Close down screen sharing and then restart.
- If multiple sites share screens at the same time this, could result in one side's images not being displayed or the screen being split in half, so check that no other sites are also sharing their screen.

➔ If using dedicated equipment (e.g. VidyoRoom or H.323)

- Is the cable between the presentation PC and the teleconferencing system connected?
- Has the cable between the presentation PC and the teleconferencing system been cut/disconnected?
Note: Confirm by replacing the cable.
- Are the output settings of the presentation PC set for external output?
- Do the resolutions of the presentation PC and the sending device match?

➔ Other general points to note

- The specifications of the presentation PC may make it impossible to share and display images, so check this beforehand.

6-3. Network Trouble



Packet loss

→ Main causes

- The network bandwidth (connection speed) between you and your counterpart (or server for teleconferences) is not enough.
- Network devices have low processing capability.
- Network devices are faulty.
- There is a network failure.
- Other unrelated programs are running on the PC that is used for the teleconferencing system.

→ Solutions

- Connect to an online network speed checker and confirm the network status.
- As required bandwidth will depend on the teleconferencing system being used, confirm with the host or the system manufacturer about required bandwidth.
- If you are using a mobile network, it could be the case that reception is poor, so try moving closer to a window to get a better connection.
Note: We recommend to use wired network instead of wireless one.
- Some computers may automatically limit bandwidth if not being used in order to conserve power.
Note: Sometimes when only images are being transferred through a teleconferencing system the PC may not recognize that a program is running and limit bandwidth, causing packet loss.

Note: To solve this issue a good idea is to open another website in the background that will regularly refresh.
- Check that there are no problems with network devices such as switching hubs.
Note: The problem may be resolved by reinserting the power cable of the hub.

-
- Check whether you are using a low-performance repeater hub or similar device.
-
- Remove the network switch and connect directly to the network.
-
- Reboot the application you are using for the teleconference.
-
- Reboot the PC you are using for the teleconference.
-
- Check that the PC isn't running automatic updates.
-
- Check that anti-virus software isn't running or doing a system check of all files.
-



Glossary

Authors • Kota TORIKAI, Fuminori MURANAGA, Ken-ichiro SHIMAI,
Masato TAGI

Term	Explanation	Page
Other		
4K	4K UHD TV (4KUHD) is a standard specified by the ITU. It provides image resolution with four times the number of pixels of full high definition images (1920x1080i).	107
B		
Bandwidth guarantee	A communications service that guarantees a minimum data transfer rate speed. Communications will always be above the guaranteed minimum speed (See "QoS").	32
Best effort	A method of communication where no guarantees are given about the speed of data transfer or transfer delays. This method is distinct from a bandwidth guarantee method, which ensures the best possible quality for communications.	33
Bug	A mistake or error in a PC program.	34
C		
Chat	Real-time character based communication over the internet. Users post text messages up to several lines long on the same screen (via a chat room or thread, etc.), enabling mutual communication.	60 87 99
D		
Default Gateway	A type of network setting for computers and communications devices that sends data to a relay device IP address in cases where no specific route to the recipient can be determined.	37
Discussion	One of the main content of any teleconference. Participants at different site exchange their questions, ideas and comments for approaching the theme of the conference.	15 39 84 113
DisplayPort	A industrial standard for connecting personal computers and audio-visual equipment, etc., to displays. There are only a few compatible devices as this standard is relatively new, having first being proposed in 2005 by the Video Electronics Standards Association (VESA), which formulates standards for video signal interfaces. It is 4K-compatible.	101
DVTS Digital Video Transport System	The transportation system of video images via the internet. A technology for sending and receiving high definition (HD) video images over an IP network, also standardized as RFC3189 and RFC3190 (DV over IP technology). By connecting personal computers and video cameras, etc., using a IEEE1394 standard interface it is possible to construct a high quality image transmission system. However, as images are hardly compressed at all a stable broadband network is required.	21 67

Term	Explanation	Page
E		
Eavesdropping	Using inappropriate means to steal data being transmitted over a network or data from a network-linked PC.	33
Echo	In audio terms this refers to a long delay in the transmission of the original sound, resulting in sound being heard again. If the delay is shorter, this is referred to as howling.	18 40 78 89 93
Echo-cancelling	A technology that functions to prevent echo and can be found on equipment like speakerphones. Many such devices are constructed to cut the sound from the audio speakers when an input signal is received from the microphone.	49 94
F		
FireWall	This technology is setup between internal networks and external networks to relay. And monitor internal and external communications and protect internal computers from cyber attacks of external network.	27
Firmware	A type of software installed on semiconductor devices that provides basic control over internal circuits and devices. It gets its name due to the fact that it remains more or less unchanged inside the device and exists as an intermediary presence between hardware and software.	36
Frame rate	The number of frames in a video that are processed in a specified unit of time. The usual unit is frames per second (fps). The higher the frame rate the smoother the video appears and lower frame rate induces a greater degree of judder in motion will appear in video.	43 78
G		
Gain	The electrical amplification factor corresponding to input signal. This is used to adjust input signal amplitude such as the microphone using an audio mixer.	72
Global/Public IP address	A Global/Public IP address (identification number) guaranteed to be unique in the world that is allocated to devices connected to the internet. In contrast to private IP addresses, Global/Public IP addresses do not require network address translation (NAT) via a router, but are able to communicate directly with an internet device.	25 43
Graphic tablet	A tablet device fitted with an internal sensor capable of recognizing the position of a special electronic pen or a pen-like pointing device and sending the information about the position or movement of the pen to a PC.	51

Term	Explanation	Page
H		
H.323	A recommendation protocol from the ITU-T that defines audio/video systems and data compression/decompression methods for enabling the sending/receiving of audio/video data between two parties via a network on equipment used for teleconference.	7 26 42
HDMI High-Definition Multimedia Interface	A proprietary standard formulated predominantly for household electronics and audio-visual equipment, based on Digital Visual Interfaces (DVI) used to connect personal computers and displays. Its key features are that it is possible to send and receive images, sound and control signals all via a single cable and that it also possesses a copy protection function for video signals using mutual device authentication. The standard version of HDMI is Ver. 1.4 and it is not compatible with 4K high-definition images. Ver. 2.0 is 4K-compatible.	101
Howling	A sound equipment issue, when the microphone of remote site picks up the original sound from own site, which is magnified by the amplifier and output through the audio speakers, then once again picked up by the microphone and amplified to a point where the acoustic pressure from the audio speakers exceeds the limits of the sound equipment. Not only does this distort sound and impede conference proceedings, it can also damage amplifiers and audio speakers. When there is a long delay this is what creates echo.	18 82 93
Hub	A line concentrator centrally positioned in the network that connects multiple network devices.	18 60 104
I		
ICT Information and Communication Technology	Acronym for Information and Communication Technology.	1
Impedance	Also known as AC resistance value. For example, it is generally the case that for a microphone, impedance is around 600 Ω , and for a LINE input it is between 10 to 50 kilo- Ω . Generally it is the case that by matching impedance values it is possible to transmit a signal efficiently. In the case of audio there are also cases where output impedance is set low and input impedance is set high. Although this method may have some impact on efficiency it does not place any burden on the output operational amplifier and sound quality is improved. (Conversely, high output and low input can cause clipping. This is the reason why clipping occurs when LINE output devices are connected to microphone input terminals.)	78
Internet provider	A business providing internet communication services.	27
IP Internet Protocol	A protocol developed under a network project by the United States Department of Defense. It is positioned as the layer 3 (network layer) of the Open Systems Interconnection (OSI) model and defines the method for addressing devices participating on the network and routing communications within interconnected networks. An IP address is a numerical label equivalent to an address on the internet. In IP Ver. 4 the IP address is expressed by four sets of numbers between 0 and 255, separated by three dots.	23 42

Term	Explanation	Page
IPsec Security Architecture for Internet Protocol	<p>A protocol suite for ensuring encrypted communications on TCP/IP networks like the internet.</p> <p>It was created using a number of elemental technologies, including Authentication Headers (AH), which authenticates communication partners to prevent fraud and eliminate falsification of data during communication, Encapsulated Security Payloads (ESP), which provide encryption for data being sent, and Internet Key Exchange (IKE), which uses public key encryption to safely exchange and share encryption keys.</p>	35
ITU-T International Telecommunication Union Telecommunication Standardization Sector	A division of the International Telecommunication Union, responsible for the formulation of standards in the telecommunication sector.	36 42
L		
LAN Local Area Network	A network technology for providing a closed communications environment, such as within a building or institution. Even if a network is laid to connect to a Wide Area Network (WAN), the communications cable is generically referred to as a LAN cable.	24
M		
MCU Multipoint Control Unit	A device used in video conferences with more than three sites, which relays live signals from multiple transmission sites.	42
Mobile network	This generally refers to wireless network services, such as 3G, 4G services of mobile phone carriers. (It refers to the wireless service provided by businesses, not Wi-Fi, which is provided through wireless LAN access points.)	104
Multimedia	Information that combines multiple media, such as sound and video.	15
Mute	Switching off the input to the microphone.	46 83 89 96
N		
NAT Network Address Translation	A technology for transferring data whereby the routers or gateways on different two TCP/IP networks automatically remap their IP addresses to the other IP address.	28
Net-Mask	A 32-bit number that defines from the leading number of the IP address how many bits will be used in the network address.	37
Network	A communications channel, or the collective terms for the devices that comprise a communications channel, through which data is passed from bases distant from one another using a PC, either with a LAN terminal for wired connections or with Wi-Fi for wireless connections.	1 4 13 23 41 76 93

Term	Explanation	Page
Network environment	The generic name for the method, equipment, lines and setup for linking a computer to a network. This refers to all the factors required for communication, including whether the connection is wired or wireless, whether via a hub, as well as IP address settings and security settings, such as a firewall, etc.	13 23 77
O		
OS Operating System	Basic software installed on personal computers that is required for basic operations, managing hardware and software resources and providing the basis for software functions for use on a personal computer. Operating systems include Windows, Linux, and OSX.	14 58
P		
Packet	A unit of data sent via data communications networks, this word refers to a small cluster of data, where control information, such as destination network address, is added to the data to be transmitted. By sending or receiving large data in multiple small packets it is possible for multiple communication entities to share and efficiently use a single line and transmission path.	33 71
Packet loss	The TCP/IP protocol splits all communications into small clumps called IP packets and transmits them. If communication quality is poor only some of these IP packets are delivered, resulting in an error. Packet loss refers to the loss in transmission of IP packets.	71 102
Panel discussion	A moderated discussion among multiple panelists.	84
PC Personal Computer	Electronic device for handling of information that comprises CPU, memory, storage device, keyboard, mouse, display and external connecting ports. It is a stand-alone device and is also referred to as a "PC."	13 29 41 76 88 95
Ping	A command used to check network communications by sending an IP packet to a host in order to confirm whether the packet is correctly delivered and if a response is received. The failure of a ping to return does not necessarily mean that the network is not connected, as security policies on devices and routers, etc., may determine whether a ping is returned or not.	37
Polycom	The name of a manufacturer of teleconferencing systems. It is also used to refer generally to teleconferencing systems (including the SONY PCS series) that are H.323 compatible.	117
Power options settings	The settings for controlling computer power output. If not used for a period of time this setting switches off power to the hard disk, display and CPU. Newly purchased computers will usually have power management settings set as the default and it is necessary to change these settings when connected to mains power to ensure that they do not cause the computer to switch off.	79

Term	Explanation	Page
Power-saving mode	Power-saving mode is when a personal PC or device switches to low-power in order to conserve electricity.	50
		79
Presentation	A way of communicating in which speakers take to the floor/podium to present information.	3
		13
		22
		41
		76
		88
		103
Private IP address	A network isolated from the public network using a firewall or router. A private IP address generally uses an IP address starting 192.168.xxx.xxx or 172.xxx.xxx.xxx and NAT conversion is required using a router to engage in external network. From external sites it appears as if that communications are only coming from the router IP address. It is generally not possible to connect from an external network to a teleconferencing system that has a private IP address. (There may be some situations in which it is possible to communicate by setting up a special relay function on the router.)	25
Projector	In the past this word was used to refer to a slide projector, whereby transparencies were shown using a focusing lens from an illuminated light source. Today although a projector works on the same principle of projecting using a light source, the input is from PC screens or video camera images.	18
		51
		82
		100
Q		
QoS Quality of Service	A standard for quality of service provided externally by devices and systems. For communications lines and networks in particular QoS is used to ensure optimized communication content quality when multiple types of communication are in use. It also refers to the technologies and functions used to ensure quality (See "Bandwidth Guarantee").	22
R		
Rehearsal	A run-through of presentations and equipment operations prior to the main event, in a situation similar to how the set up will be on the day of the main event. It provides an opportunity to check equipment operation and think about how to resolve any trouble that may occur.	17 79
Repeater hub	A hub that ensures that communications between Ethernet devices can flow from port to port. In general the more terminals that are connected to a repeater hub, the lower communications performance. Many hubs below 10Base-T were repeater hubs. Not many repeater hubs with speeds above 100Base-TX have been produced.	105
S		
Satellite	In the context of teleconferencing a satellite is a term for a sub-venue separate from the main conference venue, which is also equipped with teleconferencing equipment.	13 27

Term	Explanation	Page
Security	In internet terms security refers to protecting your devices and systems from third-party risks such as deliberate interception, disruption or obstruction of communications, or interference with network devices.	14 23
Security patch	A special program to repair or enhance security functions on a PC operating system (OS), etc. In general it is necessary to download and install all patches once they are announced by the manufacturer or developer.	79
SIP Session Initiation Protocol	A protocol for signaling and controlling multimedia communication sessions via internet telephony, using Voice Over IP (VoIP: voice communications via the internet). A standard first released in March 1999, it was developed after similar protocols like H.323.	42
Skype	A free internet telephony service using P2P technology provided by Microsoft Corporation. It also features a chat function.	44 76 89 99
Slide	In pre-computer times a slide referred to a transparency shown using a projector, but today it is generally used to refer to one page of screen data created using presentation software such as PowerPoint.	14 43 83
Software	A term used as the opposite to hardware (physical components such as CPU and memory), software refers to data constructed from programmed codes to perform specified functions on hardware. Normally software runs on an operating system and the user makes use of software functions using the screen, keyboard and mouse.	13 22 42 94
Speakerphone	A combined microphone and audio speaker used for teleconferencing, featuring echo-cancelling functions.	49 82 96
Streaming	A method for receiving and playing back video and sound via a communications network, with data receipt and playback being conducted simultaneously. This is a one-way means of communication from the sender to the receiver and is often used for the transmission of videos in teleconferences. For live streaming attention needs to be paid to network delays and also to playback quality.	18 26 44
Switching hub	A high-performance Ethernet hub designed to forward communications data only to the destination ports by using packet switching to receive.	104
Symposium	A conference or meeting held for the purpose of open and cooperative discussion on an academic or specialist theme.	76 84
System	An integrated combination of elements including the hardware, software and setups required to perform certain functions. In a narrower sense this term is also used to refer to a setup of computers or network equipment for performing various functions.	7 13 24 41

Term	Explanation	Page
T		
Teleconference	A conference connecting distant locations using communications lines.	1 12 22 42 75 88 100
Transfer Protocol	A protocol that defines rules relating to network-based communications. Also referred to as a network protocol.	42
Transport Protocol Port	A software or hardware terminal component (interface) used to input and output data from and to external sources. Porting enables software to run in an environment different to the original environment.	25 60
U		
Upload/Download	In internet communications the sending of information from a terminal to the broadband internet is referred to as uploading, and the receiving of information from the internet to a terminal is referred to as downloading.	32
UXGA Ultra eXtended Graphics Array	A standard for the number of pixels on a PC screen. UXGA is composed of 1600×1200 pixels.	100
V		
VGA Video Graphics Array	A graphics system developed by IBM Corporation and first installed on their PS/2 line of computers, with a 640×480 pixels resolution. As in this manual there are also cases when this refers to the D-SUB 15-pin (5 pins × 3 rows) of an analog RGB-type video terminal. VGA is widely used and there are many cases where it is not possible to link to a project without this type of video terminal.	101
Vidyo	A teleconferencing system provided by Vidyo, Inc. Under the Globalization Project of the Standing Committee of the National University Hospital Council of Japan a main server has been installed at Kyushu University.	26 44 97
VidyoDesktop	A software-based Vidyo system. It is designed with individual users in mind.	42 94
VidyoRoom	A hardware-based Vidyo system. It is designed with a multipoint teleconference in mind and is compatible with up to two 4K (high definition) displays. It offers excellent performance for sharing video contents.	44 103
VLAN Virtual LAN	A technology for creating a virtual LAN environment. It is possible to create multiple independent networks on a physical network.	28
VPN Virtual Private Network	An internet communications technology that enables users to send and receive data only through a connected each private network, using encryption or traffic control technologies.	26

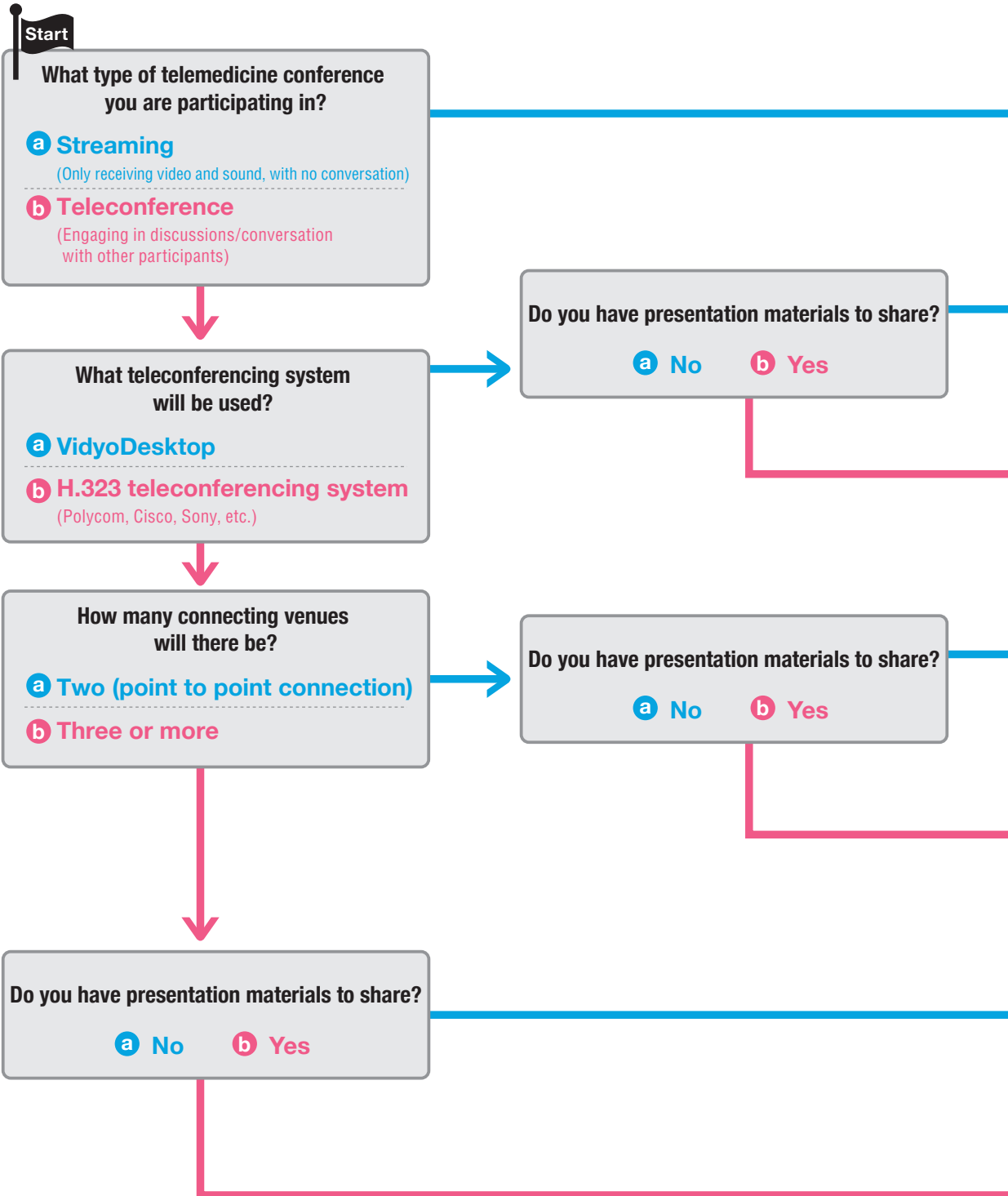
Term	Explanation	Page
VPN router Virtual Private Network router	A communications device that uses the public internet to relay information between networks, forming a network that lets users send and receive data with the functional, security and management benefits of a private network, almost as though the user was directly connected to an intranet.	35
W		
Web conference	A teleconferencing system operated via an internet browser.	42
Web server	A PC and software that uses web-based systems, to provide information and functions to a user's PC via a network. A web server can be either a server PC that provides such functions, or server software that operates on the server PC.	37
X		
XGA eXtended Graphics Array	A standard for the number of pixels on a PC screen. XGA comprises 1024 x 768 pixels vertically.	100

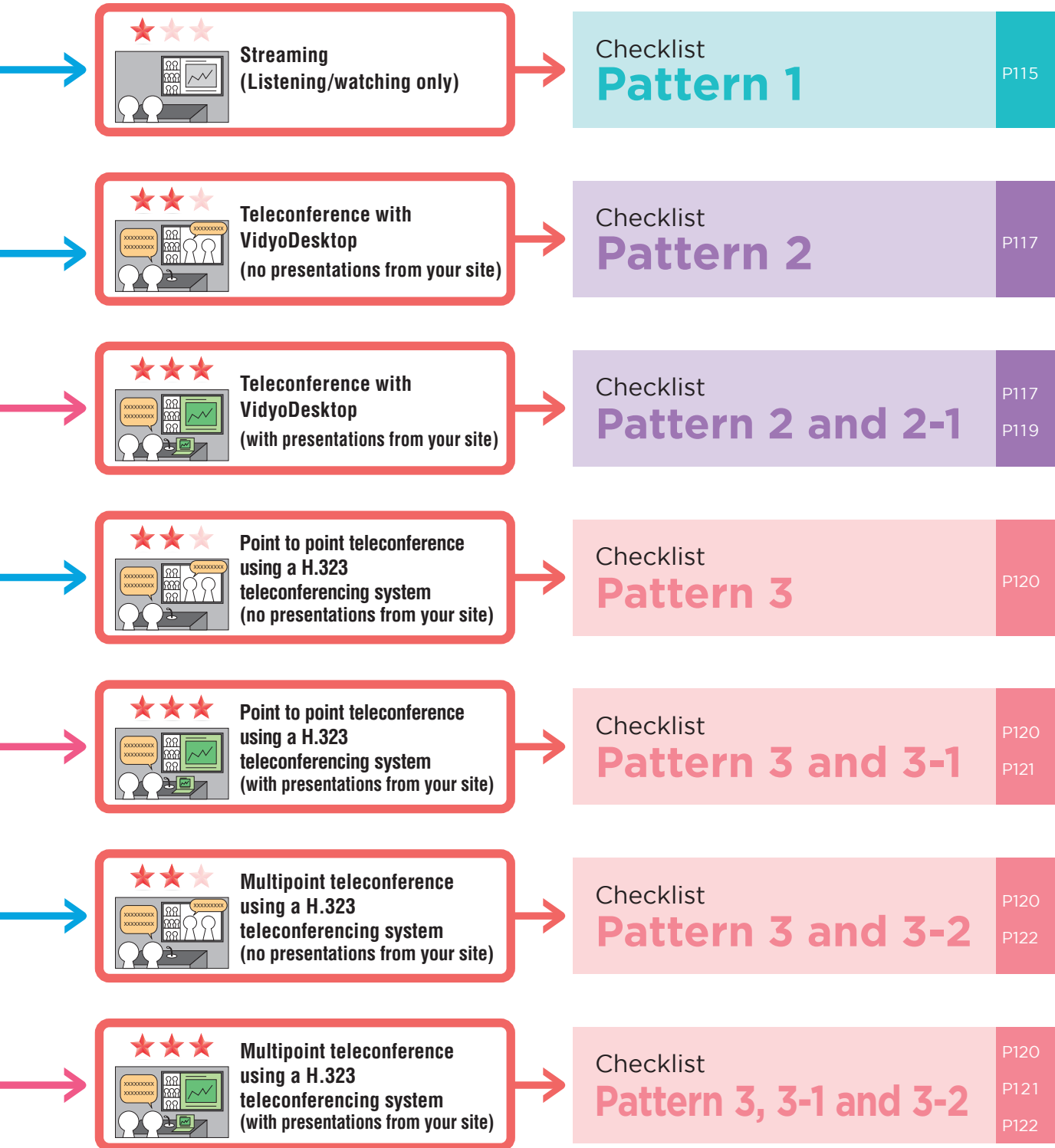
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Flowchart for Determining Event Type

Check the type of event!





Checklist Depending on Event Type

Confirm the checklist that matches your event type!

Pattern 1

★★★ Streaming (Listening/watching only)

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| <input type="checkbox"/> Security patches and software updates have been applied to computers. | Chapter1 Advance Preparations
4-3 Venue Setup |
| <input type="checkbox"/> PC is connected to a wired network . | 2-2 Networks |
| <input type="checkbox"/> Care is taken to ensure teleconference security , including personal and private information . | 2-3 Networks |
| <input type="checkbox"/> Network bandwidth download speed of 1Mbps or more. | 2-3-2 Networks |
| <input type="checkbox"/> Audio speakers are connected. | 3-1 Teleconferencing Systems |
| <input type="checkbox"/> Displays and monitors are connected. | 3-1 Teleconferencing Systems |
| <input type="checkbox"/> Already understand or know with counterpart location that discussion is not possible with streaming. | 3-1-1 Teleconferencing Systems |
| <input type="checkbox"/> Already have audio speakers and PC connected to the internet . | 3-1-1 Teleconferencing Systems |
| <input type="checkbox"/> Checked that once transmission begins Vidyo streaming will run smoothly . | 3-2-3 Teleconferencing Systems |
| <input type="checkbox"/> Know URL and PIN number of access point. | 3-2-3 Teleconferencing Systems |
| <input type="checkbox"/> Able to access URL of access point. | 3-2-3 Teleconferencing Systems |
| <input type="checkbox"/> Adobe Flash Player is already installed to the PC. | 3-2-3 Teleconferencing Systems |
| <input type="checkbox"/> Method of communication with host has been confirmed in advance, in case of trouble. | 4-1 Venue Setup |
| <input type="checkbox"/> Location of power sockets and network equipment has been checked with the setup for the conference in mind. | 4-2 Venue Setup |
| <input type="checkbox"/> Conference room can be booked for an extended period for preparation and to accommodate the conference schedule. | 4-2 Venue Setup |
| <input type="checkbox"/> Connection should have been done in a quiet location . | 4-3 Venue Setup |
| <input type="checkbox"/> Computers have been checked so that they will not go into power-saving mode during streaming. | 4-3 Venue Setup |
| <input type="checkbox"/> Computers are connected to mains power . | 4-3 Venue Setup |

<input type="checkbox"/> Conference information, including location of toilets , etc., has been provided to participants.	4-3	Venue Setup
<input type="checkbox"/> Power and connection cables have been fixed with tape and lines of flow in the room have been established.	4-3	Venue Setup
<input type="checkbox"/> Participants have been notified in advance that they will be seen on conference video .	5-1	Points to Note During the Main Teleconference
<input type="checkbox"/> A record of the conference/streaming is made, including photos , etc.	5-2	Points to Note During the Main Teleconference
<input type="checkbox"/> Equipment, chairs and tables are all in position .	5-3	Points to Note During the Main Teleconference
<input type="checkbox"/> Lighting is adjusted to make the screen easy to see.	5-3	Points to Note During the Main Teleconference

Pattern 2

★★★ Teleconference with VidyoDesktop

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| <input type="checkbox"/> Security patches and software updates have been applied to computers. | Chapter1 Advance Preparations
4-3 Venue Setup |
| <input type="checkbox"/> PC is connected to a wired network . | 2-2 Networks |
| <input type="checkbox"/> Network bandwidth upload/download speed of 1Mbps or more. | 2-3 Networks |
| <input type="checkbox"/> Care is taken to ensure teleconference security , including personal and private information . | 2-3-2 Networks |
| <input type="checkbox"/> Speakerphones recommended for VidyoDesktop are connected and an omnidirectional microphone (such as an internal PC microphone) is not being used . | 3-1-2 Teleconferencing Systems
3-2-2 |
| <input type="checkbox"/> Your venue is not causing echo . | 3-1-3 Teleconferencing Systems |
| <input type="checkbox"/> If a video camera is being used, the demo or power-saving mode has been disabled . | 3-1-3 Teleconferencing Systems |
| <input type="checkbox"/> PC CPU has a processor equivalent to Core2Duo 2GHz or more and a memory of 2GB or more. | 3-2-2 Teleconferencing Systems |
| <input type="checkbox"/> VidyoPortal, login ID and password are known. | 3-2-2 Teleconferencing Systems |
| <input type="checkbox"/> Able to login to VidyoPortal . | 3-2-2 Teleconferencing Systems |
| <input type="checkbox"/> Able to login in to conference room of Vidyo. | 3-2-2 Teleconferencing Systems |
| <input type="checkbox"/> The conference screen is displayed . | 3-2-2 Teleconferencing Systems |
| <input type="checkbox"/> A web camera recommended for VidyoDesktop is connected. | 3-2-2 Teleconferencing Systems |
| <input type="checkbox"/> 'Auto Adjust Microphone Level' function is switched off in VidyoDesktop contigration menu. | 3-2-2 Teleconferencing Systems |
| <input type="checkbox"/> 'Echo Cancellation' function is switched off , in VidyoDesktop contigration menu. | 3-2-2 Teleconferencing Systems |
| <input type="checkbox"/> Microphone volume level is set appropriately using the recording device settings on the PC. | 3-2-2 Teleconferencing Systems |
| <input type="checkbox"/> Explanation has been provided to participants about keeping microphones muted when not talking. | 3-2-2 Teleconferencing Systems |
| <input type="checkbox"/> All unnecessary programs and processing have been switched off on computers. | 3-2-2 Teleconferencing Systems |

<input type="checkbox"/> The camera, microphone and audio speakers that are to be used have been selected using VidyoDesktop device settings .	3-2-2	Teleconferencing Systems
<input type="checkbox"/> The camera is working properly.	3-2-2	Teleconferencing Systems
<input type="checkbox"/> When not speaking all microphones are muted .	3-2-2	Teleconferencing Systems
<input type="checkbox"/> Method of communication with host has been confirmed in advance, in case of trouble.	5-2	Points to Note During the Main Teleconference
<input type="checkbox"/> Method of communication with host has been confirmed in advance, in case of trouble.	4-1	Venue Setup
<input type="checkbox"/> Location of power sockets and network equipment has been checked with the setup for the conference in mind.	4-2	Venue Setup
<input type="checkbox"/> Conference room can be booked for an extended period for preparation and to accommodate the conference schedule.	4-2	Venue Setup
<input type="checkbox"/> Computers are connected to mains power .	4-3	Venue Setup
<input type="checkbox"/> Computers have been checked so that they will not go into power-saving mode .	4-3	Venue Setup
<input type="checkbox"/> Power and connection cables have been fixed with tape and lines of flow in the room have been established.	4-3	Venue Setup
<input type="checkbox"/> Microphones and audio speakers are not pointing towards each other and are spaced apart .	4-3	Venue Setup
<input type="checkbox"/> A sign is in place so that participants at other locations can see the name of the organization .	4-3	Venue Setup
<input type="checkbox"/> Conference information, including location of toilets, etc. , has been provided to participants.	4-3	Venue Setup
<input type="checkbox"/> Connection will be in a quiet location .	4-3	Venue Setup
<input type="checkbox"/> Displays, cameras and microphones have been adjusted to aid natural conversation.	4-3	Venue Setup
<input type="checkbox"/> Participants have been notified in advance that scenes from the room will be recorded .	5-1	Points to Note During the Main Teleconference
<input type="checkbox"/> Skype or other means are in place so that technicians at other conference venues can always be contacted .	5-2	Points to Note During the Main Teleconference
<input type="checkbox"/> A record of the conference/streaming is made, including photos, etc.	5-2	Points to Note During the Main Teleconference
<input type="checkbox"/> Volume is well-balanced among all participating venues.	5-2	Points to Note During the Main Teleconference
<input type="checkbox"/> Equipment, chairs and tables are all in position .	5-3	Points to Note During the Main Teleconference

<input type="checkbox"/> Lighting is adjusted to make the screen easy to see.	5-3	Points to Note During the Main Teleconference
<input type="checkbox"/> Lighting is adjusted so that participants' faces at your venue can be clearly seen by other venues.	5-3	Points to Note During the Main Teleconference
<input type="checkbox"/> Microphones are positioned away from air conditioning units or fans.	5-3	Points to Note During the Main Teleconference
<input type="checkbox"/> You can hear participants at other venues.	6-1	Troubleshooting
<input type="checkbox"/> Participants at other venues can hear you .	6-1	Troubleshooting
<input type="checkbox"/> There are no problems with echo or sound dropping with the sound you receive.	6-1	Troubleshooting
<input type="checkbox"/> You can see participants at other venues.	6-2	Troubleshooting
<input type="checkbox"/> Participants at other venues can see you .	6-2	Troubleshooting
<input type="checkbox"/> The presentation materials are transmitted and displayed.	6-3	Troubleshooting

Pattern 2-1

★★★ **Check these things too if the conference includes presentation materials from your site!**

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <input type="checkbox"/> The number of speakers, length of presentation and presentation order has been informed by the host and confirmed with the chair/moderator. | Chapter1 Advance Preparations |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
- | | |
|----------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <input type="checkbox"/> Presentation software like PowerPoint and Keynote is installed on the PC to be used. | Chapter1 Advance Preparations |
|----------------------------------------------------------------------------------------------------------------------|-------------------------------|
- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <input type="checkbox"/> Confirmed with presenters about the file format and contents, and whether presentations contain videos or sound. | Chapter1 Advance Preparations |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
- | | |
|------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <input type="checkbox"/> Explanation has been provided to participants about the method of presentation. | Chapter1 Advance Preparations |
|------------------------------------------------------------------------------------------------------------------------|-------------------------------|
- | | |
|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <input type="checkbox"/> Presenters have been asked to compress or reduce the size of extremely large presentation files. | Chapter1 Advance Preparations |
|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| <input type="checkbox"/> Confirmed with presenters that the presentation data (slides) must be played on the computer being used with VidyoDesktop. | Chapter1 Advance Preparations
3-2-2 Teleconferencing Systems |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
- | | |
|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| <input type="checkbox"/> Presentations materials have also been distributed to other conference venues in advance. | Chapter1 Advance Preparations
4-3 Venue Setup |
|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| <input type="checkbox"/> Thought about response measures for presentations with videos, which do not run smoothly on VidyoDesktop. | 3-2-2 Teleconferencing Systems |
|-------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| <input type="checkbox"/> Thought about response measures for presentations with sound, as sound cannot be sent using the share function on VidyoDesktop. | 3-2-2 Teleconferencing Systems |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
- | | |
|---------------------------------------------------------------------------------------------------|--------------------------------|
| <input type="checkbox"/> Materials are sent not as PowerPoint, but by sharing the desktop. | 3-2-2 Teleconferencing Systems |
|---------------------------------------------------------------------------------------------------|--------------------------------|
- | | |
|------------------------------------------------------------------------------------------------|--------------------------------|
| <input type="checkbox"/> Sharing desktop function is stopped when presentation is over. | 3-2-2 Teleconferencing Systems |
|------------------------------------------------------------------------------------------------|--------------------------------|
- | | |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| <input type="checkbox"/> All participants in other venue can see the presentation materials from your venue without any problems. | 6-3 Troubleshooting |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------|

Pattern 3

★★★ Point to point teleconference using a H.323 teleconferencing system

- | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------------------------------------------|
| <input type="checkbox"/> PC is connected to a wired network . | 2-2 | Networks |
| <input type="checkbox"/> Connected to a Global/Public IP address or a private IP address with a NAT setting. | 2-2 | Networks |
| <input type="checkbox"/> Care is taken to ensure teleconference security , including personal and private information. | 2-2 | Networks |
| <input type="checkbox"/> Network bandwidth upload/download speed of 1Mbps or more. | 2-3-2 | Networks |
| <input type="checkbox"/> A wired microphone is being used. | 3-1-2 | Teleconferencing Systems |
| <input type="checkbox"/> Your venue is not causing echo . | 3-1-3 | Teleconferencing Systems |
| <input type="checkbox"/> If a video camera is being used, the demo or power-saving mode has been disabled . | 3-1-3 | Teleconferencing Systems |
| <input type="checkbox"/> The teleconferencing system is connected to mains power, microphones, audio speakers, camera, displays and a network . | 3-2-1 | Teleconferencing Systems |
| <input type="checkbox"/> The Global/Public IP address of the access point is known. | 3-2-1 | Teleconferencing Systems |
| <input type="checkbox"/> Network, video and sound devices are set up appropriately . | 3-2-1 | Teleconferencing Systems |
| <input type="checkbox"/> It is possible to input the access point address, connect and make communication . | 3-2-1 | Teleconferencing Systems |
| <input type="checkbox"/> Permission is granted to receive from other parties . | 3-2-1 | Teleconferencing Systems |
| <input type="checkbox"/> Explanation has been provided to participants about keeping microphones muted when not talking. | 3-2-2 | Teleconferencing Systems |
| <input type="checkbox"/> When not speaking all microphones are muted . | 3-2-2 | Teleconferencing Systems |
| | 5-2 | Points to Note During the Main Teleconference |
| <input type="checkbox"/> Method of communication with host has been confirmed in advance, in case of trouble. | 4-1 | Venue Setup |
| <input type="checkbox"/> Location of power sockets and network equipment has been checked with the setup for the conference in mind. | 4-2 | Venue Setup |
| <input type="checkbox"/> Conference room can be booked for an extended period for preparation and to accommodate the conference schedule. | 4-2 | Venue Setup |
| <input type="checkbox"/> Power and connection cables have been fixed with tape and lines of flow in the room have been established . | 4-3 | Venue Setup |

<input type="checkbox"/> Microphones and audio speakers are not pointing towards each other and are spaced apart.	4-3	Venue Setup
<input type="checkbox"/> Conference information, including location of toilets , etc., has been provided to participants.	4-3	Venue Setup
<input type="checkbox"/> Connection will be in a quiet location .	4-3	Venue Setup
<input type="checkbox"/> Displays, cameras and microphones have been adjusted to aid natural conversation.	4-3	Venue Setup
<input type="checkbox"/> Participants have been notified in advance that scenes from the room will be recorded .	5-1	Points to Note During the Main Teleconference
<input type="checkbox"/> Skype or other means are in place so that technicians at other conference venues can always be contacted .	5-2	Points to Note During the Main Teleconference
<input type="checkbox"/> A record of the conference/streaming is made, including photos, etc.	5-2	Points to Note During the Main Teleconference
<input type="checkbox"/> Equipment, chairs and tables are all in position .	5-3	Points to Note During the Main Teleconference
<input type="checkbox"/> Lighting is adjusted to make the screen easy to see.	5-3	Points to Note During the Main Teleconference
<input type="checkbox"/> Lighting is adjusted so that participants' faces at your venue can be clearly seen by other venues.	5-3	Points to Note During the Main Teleconference
<input type="checkbox"/> Microphones are positioned away from air conditioning units or fans.	5-3	Points to Note During the Main Teleconference
<input type="checkbox"/> You can hear participants at other venues.	6-1	Troubleshooting
<input type="checkbox"/> Participants at other venues can hear you .	6-1	Troubleshooting
<input type="checkbox"/> There are no problems with echo or sound dropping with the sound you receive.	6-1	Troubleshooting
<input type="checkbox"/> You can see participants at other venues.	6-2	Troubleshooting
<input type="checkbox"/> Participants at other venues can see you .	6-2	Troubleshooting
<input type="checkbox"/> The presentation materials are transmitted and displayed.	6-3	Troubleshooting

Pattern 3-1

★★★ Multipoint teleconference using a H.323 teleconferencing system

- The connection method for **the MCU room number of the access point is known.** 3-2-1 Teleconferencing Systems
- A sign** is in place so that participants at other locations can see **the name of the organization.** 4-3 Venue Setup
- Volume is well-balanced** among all participating venues. 5-2 Points to Note During the Main Teleconference

Pattern 3-2

★★★ Check these things too if the conference includes presentation materials from your site!

- The number of speakers, length of presentation and presentation order** has been informed by the host and confirmed with the chair/moderator. Chapter1 Advance Preparations
- Presentation software** like PowerPoint and Keynote is installed on the PC to be used. Chapter1 Advance Preparations
- Confirmed with presenters on which PC the **presentation (slide) data will be played.** Chapter1 Advance Preparations
- Confirmed with presenters about **the file format and contents, and whether presentations contain videos or sound.** Chapter1 Advance Preparations
- Explanation** has been provided to participants **about the method of presentation.** Chapter1 Advance Preparations
- Presenters have been asked to compress or reduce **the size of extremely large presentation files.** Chapter1 Advance Preparations
- Presentations materials have also been distributed to other conference venues in advance.** Chapter1 Advance Preparations
4-3 Venue Setup
- Security patches and updates** have been applied to computers. Chapter1 Advance Preparations
4-3 Venue Setup
- The PC for displaying presentation materials is **connected.** 3-1 Teleconferencing Systems
- Thought about response measures for presentations with sound,** as sound cannot be sent as part of the presentation. 3-1-1 Teleconferencing Systems

-
- Sharing function is stopped** when presentation is over.

3-2-1

Teleconferencing Systems

 - For presentations that include video**, the contents sharing function is not used, but data is sent by **switching to main source**.

3-2-1

Teleconferencing Systems

 - Computers are **connected to mains power**.

4-3

Venue Setup

 - Computers have been checked so that they **will not go into power-saving mode**.

4-3

Venue Setup

 - All unnecessary programs and processing have been switched off** on computers.

Chapter6

Troubleshooting

 - Participants in other venue **can see the presentation** materials from your venue without any problems.

6-3

Troubleshooting

 - For **presentations that include sound**, participants in other venue **can hear** the presentation materials from your venue without any problems.

6-3

Troubleshooting

H.323 Teleconferencing System List

Polycom HDX 7000



Maximum bandwidth	4Mbps
Maximum resolution	1080p
M C U	OK*option
2-screen output	OK
Content Sharing	OK

Polycom HDX 8000



Maximum bandwidth	6Mbps
Maximum resolution	1080p
M C U	OK*option
2-screen output	OK
Content Sharing	OK

Polycom VSX 7000e



Maximum bandwidth	2Mbps
Maximum resolution	XGA(1024x768)
M C U	OK*option
2-screen output	OK
Content Sharing	OK*option

Polycom VSX 7000s



Maximum bandwidth	2Mbps
Maximum resolution	XGA(1024x768)
M C U	OK*option
2-screen output	OK
Content Sharing	OK*option

Polycom HDX 9000



Maximum bandwidth	6Mbps
Maximum resolution	1080p
M C U	OK*option
2-screen output	OK
Content Sharing	OK

Polycom VSX 6000



Maximum bandwidth	768Kbps
Maximum resolution	XGA(1024x768)
M C U	-
2-screen output	OK
Content Sharing	OK*option

Polycom HDX 4500



Maximum bandwidth	4Mbps
Maximum resolution	1080p(30fps) ,720p(60fps)
M C U	OK*option
2-screen output	OK
Content Sharing	OK

Polycom HDX 6000-720



Maximum bandwidth	2Mbps
Maximum resolution	720p
M C U	-
2-screen output	-
Content Sharing	OK

Polycom HDX 8004 XL



Maximum bandwidth	4Mbps
Maximum resolution	720p
M C U	OK*option
2-screen output	OK
Content Sharing	OK

Polycom HDX 9002



Maximum bandwidth	2Mbps
Maximum resolution	720p(30fps)
M C U	OK*option
2-screen output	OK
Content Sharing	OK

Polycom HDX 9004



Maximum bandwidth	4Mbps
Maximum resolution	720p(30fps)
M C U	OK*option
2-screen output	OK
Content Sharing	OK

Polycom RealPresence Group 700



Maximum bandwidth	6Mbps
Maximum resolution	OK*option/720p
M C U	OK*option
2-screen output	OK
Content Sharing	OK

Polycom VSX 8000



Maximum bandwidth	2Mbps
Maximum resolution	XGA(1024x768)
M C U	OK*option
2-screen output	OK
Content Sharing	OK

Polycom RealPresence Group 500



Maximum bandwidth	6Mbps
Maximum resolution	1080p*option/720p
M C U	OK*option
2-screen output	OK
Content Sharing	OK

Polycom RealPresence Group 310



Maximum bandwidth	3Mbps
Maximum resolution	1080p*option/720p
M C U	-
2-screen output	OK*option
Content Sharing	OK

Sony PCS-XG80



Maximum bandwidth	10Mbps
Maximum resolution	1080p(Facing connection 1080i)
M C U	OK*option
2-screen output	OK
Content Sharing	OK*option

Sony PCS-XG100



Maximum bandwidth	16Mbps
Maximum resolution	1080p(60fps)
M C U	OK*option
2-screen output	OK
Content Sharing	OK

Sony PCS-XC1



Maximum bandwidth	4Mbps
Maximum resolution	1080p(60fps)
M C U	OK*option
2-screen output	-
Content Sharing	OK

Sony PCS-XL55



Maximum bandwidth	4Mbps
Maximum resolution	720p(60fps)
M C U	OK*option
2-screen output	-
Content Sharing	OK

Cisco SX10 Quick Set



Maximum bandwidth	3Mbps
Maximum resolution	1080p(30fps)
M C U	-
2-screen output	-
Content Sharing	OK

Cisco SX20 Quick Set



Maximum bandwidth	6Mbps
Maximum resolution	1080p(60fps)
M C U	OK*option
2-screen output	OK
Content Sharing	OK

Cisco MX200 G2



Maximum bandwidth	6Mbps
Maximum resolution	1080p(60fps)
M C U	OK*option
2-screen output	OK
Content Sharing	OK

Cisco MX300 G2



Maximum bandwidth	6Mbps
Maximum resolution	1080p(60fps)
M C U	OK*option
2-screen output	OK
Content Sharing	OK

Cisco MX700



Maximum bandwidth	10Mbps
Maximum resolution	1080p(60fps)
M C U	OK*option
2-screen output	OK
Content Sharing	OK

Cisco MX800



Maximum bandwidth	10Mbps
Maximum resolution	1080p(60fps)
M C U	OK*option
2-screen output	OK
Content Sharing	OK

Cisco MX800 Dual



Maximum bandwidth	10Mbps
Maximum resolution	1080p(60fps)
M C U	OK*option
2-screen output	OK
Content Sharing	OK

Cisco SX80



Maximum bandwidth	10Mbps
Maximum resolution	1080p(60fps)
M C U	OK*option
2-screen output	OK
Content Sharing	OK

Cisco DX70



Maximum bandwidth	4Mbps
Maximum resolution	1080p(30fps)
M C U	-
2-screen output	-
Content Sharing	OK

Cisco DX80



Maximum bandwidth	4Mbps
Maximum resolution	1080p(30fps)
M C U	-
2-screen output	-
Content Sharing	OK

Cisco EX90



Maximum bandwidth	6Mbps
Maximum resolution	1080p(30fps)
M C U	OK*option
2-screen output	OK
Content Sharing	OK

Lifesize Room 220



Maximum bandwidth	8Mbps		
Maximum resolution	1080p(30fps)		
M	C	U	OK
2-screen output	OK		
Content Sharing	OK		

Lifesize Express 220



Maximum bandwidth	4Mbps		
Maximum resolution	1080p(30fps)		
M	C	U	-
2-screen output	OK		
Content Sharing	OK		

Lifesize Icon 600



Maximum bandwidth	6Mbps		
Maximum resolution	1080p(60fps)		
M	C	U	-
2-screen output	OK*option		
Content Sharing	OK		

Panasonic KX-VC600

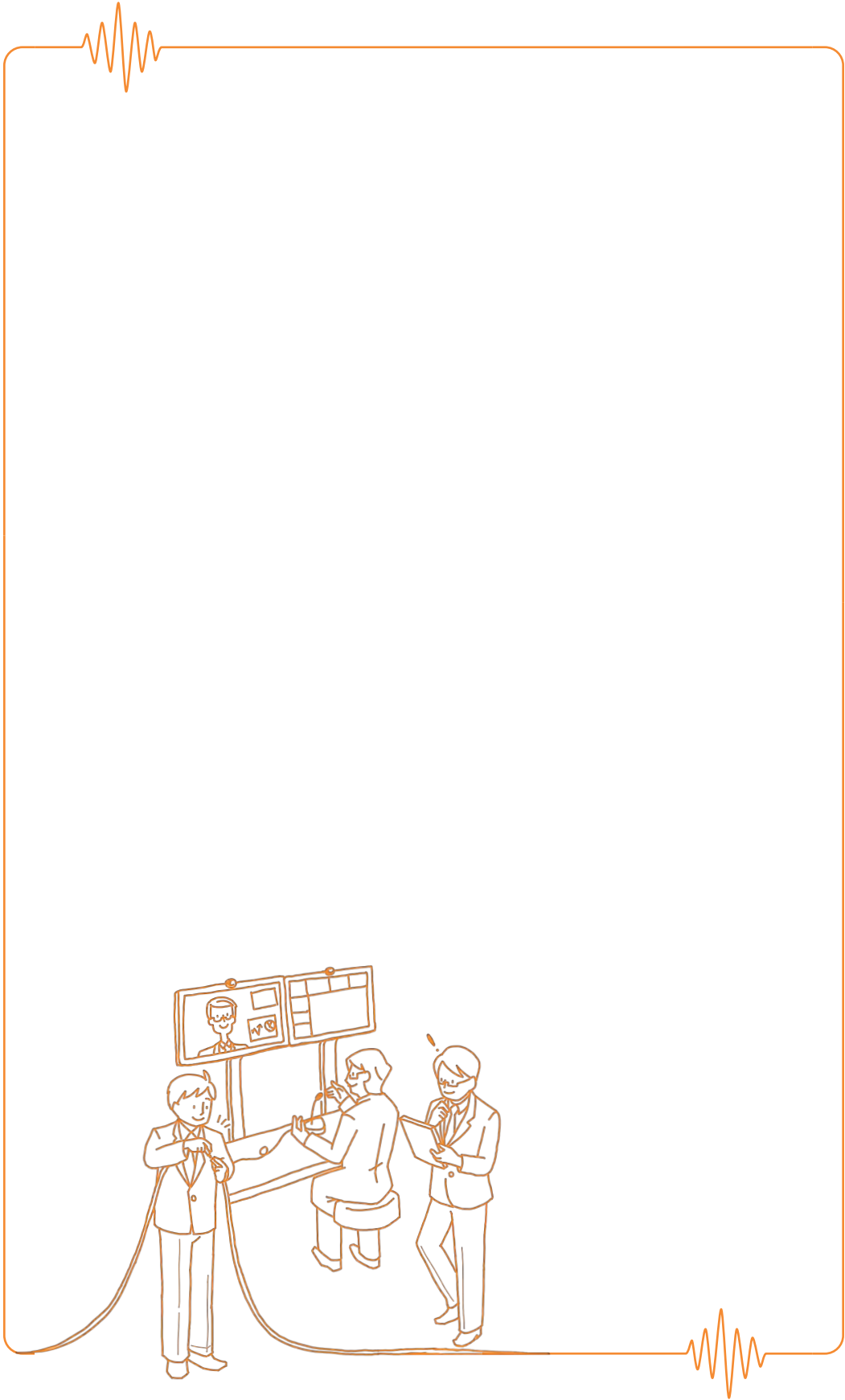


Maximum bandwidth	9Mbps		
Maximum resolution	1080i		
M	C	U	OK(Up to four sites)
2-screen output	-		
Content Sharing	OK		

Panasonic KX-VC1600J



Maximum bandwidth	18Mbps		
Maximum resolution	1080p		
M	C	U	OK(Up to six sites)
2-screen output	OK		
Content Sharing	OK		



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Telemedicine Conferencing

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Supervisors: Shuji SHIMIZU, Naoki NAKASHIMA

Editors: Kuriko KUDO, Yasuaki ANTOKU

Author: Technology Team, Globalization Section, Standing Committee
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