# REMOTE HUB TECHNICAL DOCUMENTATION V1.0

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# NIXI

# Remote Participation Hub

# (Technical Documentation)

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# INTRODUCTION

Initially, video conferencing was the reserve of larger companies and organizations who could afford to invest in the endpoints, infrastructure and personnel required to successfully implement an On-Premise solution that was then made available to select employees or workgroups. Hence, the endpoints were typically for conference rooms or small project teams and would be located on the corporate intranet behind a robust firewall. For added security, some systems would be restricted to only use ISDN connectivity. In general, they were not readily available to everyone, especially not on their desktop.

Moving forward, video conferencing systems have gradually migrated down to the PC and are available on the desktop, but they typically still use the corporate intranet behind the firewall. As the number of endpoints increases, so does the bandwidth requirements, complexity of the network and associated video infrastructure; all of which needs supporting and maintaining. So whilst the cost per endpoint has reduced, the cost of supplying, supporting and maintaining the in-house network and video infrastructure has increased and can represent a significant portion of the total video conferencing costs.

This can pose a dilemma for SME and small organizations who see the benefits of video conferencing. They want to use the technology, but only need a few endpoints; they want the security of a robust video infrastructure, but either don't have the staff, don't want the cost of outsourcing support, don't have the bandwidth resources or simply don't want the hassle of managing it themselves.

One option is to use a Cloud solution. These provides all the essential video infrastructure as a fully supported hosted service charged on an annual basis. You typically choose and provide the endpoints, the Cloud provides the interconnectivity, including multipoint capability. Using a Cloud solution may also have financial benefits as it's a subscription service and not a capital expenditure.

# Remote Participation

## Objectives & Principles

The guiding principles behind the provision of services is as follows:

### A more standardized approach

The Internet community is global and needs to have the tools to participate in the work of Internet Governance effectively and efficiently. Services required to facilitate a global Internet event are not the same services required for a monthly community working call. Remote participants should be able to easily understand the services to expect for each type of session and easily access them.

### Equalized experience

Both high and low bandwidth options are available, so that those with limited connections have an equal opportunity to participate remotely using low-bandwidth streaming audio feed (for those sessions that support streaming audio). Additionally, at all IIG meetings, in-room staff facilitates the audio and, if available, video experience to include remote participants in all aspects of the session, as if they were in the physical room.

### Choice of Operating System

Services and tools are available on variety of devices and platforms, and do not require additional installations or support. Where possible, open source products and systems are utilized.

## Monitoring Services during Sessions

A key part of ensuring the remote participation experience works well is ensuring that services are monitored – from both a technical and operational perspective. A remote participation manager and technical staff will be connected to the chat room for meetings with chat facilities so that remote participants can identify problems they experience (for example, that audio volume is too low for certain speakers on audio streams).

# Requirements for Remote participation Hub

- Must support screen sharing, chat, video, recording, registration, muting, participant management
- Must be able to accommodate up to 50 remote participants
- Bridge between conference room AV and Web conference audio
- Technical assistance for conference setup
- A Good and Smart video display unit
- Good and stable Bandwidth (Refer Page 8)

## Solutions

There are three models to fulfil the above requirements based upon nature of Conference i.e. Hosting or Participation

**Remote Hub (Participation)**

**Definition**: Remote hub can be defined as "The location where community members can walk-in and can start participating in the remote conference without bringing any device". All the necessary hardware and software is already installed and configured in advanced to support remote participation.

### Solution 1

It includes use of "USB Camera" and "USB Audio Devices" with Smart video display and bandwidth to facilitate the participation.

**USB Camera features**

- Cameras offering 360° movements
- Continuous pan rotation and presets making it an apt device
- Product for a larger room with multiple participants
- Full HD camera offering 1080i quality vivid images. Equipped with a FHD, 10X Optical zoom lens for capturing larger audience groups in turn enhancing the conferencing experience.

**Audio Device Feature**

- Built In Mic and Speaker
- Output Connectivity – USB
- Remarkable voice quality
- Output Volume – 87 dB
- Dynamic noise reduction
- Automatic gain control
- Echo cancellation

**Advantages:**

- User can walk-in to the remote-hub and can start participating in the conferences remotely.
- No need to bring any device

**Disadvantages:**

- Users can only participate .They cannot start the conference and host the conference.

## Solution 2

This solution is the combination of Solution 1 and Cloud Subscription (To facilitate Hosting)

**Solution 2 = Solution1 + Cloud Subscription**
**Cloud Features:**

- Invite others to meet in a personalized, always-available meeting room anytime
- Create an ad-hoc meeting whenever needed, or start a new meeting, instantly
- Reserve needed rooms and resources for scheduled meetings with a defined audience
- Simple - Use easy controls to create, launch, and join meetings.
- Scalable - Support up to 50 participants in a single meeting.
- Global - Extend global reach with data centers all over the world, offering consistent quality.

- Flexible - Cloud deployment model is offered as a subscription service.
- Proven **– It should integrate industry-leading voice, video, and content sharing technologies into one experience**

**Advantages:**

- Users can Host a meeting and can send a link to participants to join the meeting, initiated by NIXI.
- As it is cloud based, user can join the meeting from, cell phones, iPads, Laptops, Desktop's etc.
- Recording of Hosted conference is available depending upon the cloud subscription.

**Disadvantages (Solution 2)**

- While hosting we can connect to hardware VC solution only if endpoint present at the far end supports meeting links from cloud (SIP Based)
- Note: IGF, ICANN, ISOC, ITU are using Adobe Connect and Webex which do not support H.323 calls.

### Solution 3

Above solution is the combination of Complete VC endpoint with Codec
(Complete VC hardware) + Cloud subscription.

**Advantages:**

- Two way participation.
- All types of hosting flexibility
- VC endpoint to VC endpoint connectivity (Multipoint also available depending upon license type)
- All the standard features of "**On-Premise VC" solution and Cloud based solution are available**

**Disadvantages:**

- Participation using codec based (Camera and Audio) with WebEx and Adobe connect link is Very limited or not possible.
- Expensive than solution 1 and Solution 2

## Comparative Matrix for above described 3 solutions:

| Solution | Features | Objective Achieved | Comments |
|---|---|---|---|
| **Solution 1** | FHD USB camera + Audio Device + Good Bandwidth + Smart LED 55' Display | Participation Only | **Recommended:** **It is recommended to use solution 1, however** it will only achieve the goal of Remote participation only **NOTE:** Initially the use of trail subscriptions of WebEx (14 days) and Adobe Connect (30 Days) with **solution 1** is also recommended. Based up on the trail results we might go for annual cloud subscription of above mentioned web-conference technologies. |
| **Solution 2** | FHD USB camera + Audio Device +Good Bandwidth + Smart LED 55' Display +**Annual Cloud Subscription (WebEx or Adobe Connect)** | Participation as well as Hosting | Remote participation as well as goal conference hosting will be achieved. It can help us while organizing round tables as it will reduces the cost of cloud infrastructure rent we spend in each roundtable. |

| | | | |
|---|---|---|---|
| **Solution 3** | VC end Point Solution with camera, Audio and Codec + Cloud Subscription +Good Bandwidth + Smart LED 55' Display | All the standard features of On-Premise VC solution and Cloud based solution are available but Limited or no participation with links of Adobe and WebEx(SIP Call not Supported now) | It can be used if and only if on far end VC end point is available with the support to Hardware call (H.323) and SIP Call.<br><br>**Highly Expensive.** |

# Best Practices

## Remote Participation

In order for groups of individuals to remotely participate in the meetings, there are certain technical requirements that must be met to ensure a non--- disruptive and trouble---free meeting experience.

This document outlines the proper configuration for remote participation to various conferences throughout the world.

## Bandwidth

Adequate and good quality wired bandwidth is extremely important in order to have audio, video and presentations properly shared in both directions. You will also likely need to provide Wi---Fi Internet access to your participants.

**Rule of thumb** is that you will need 2Mbps for the audio, video and presentations, plus at least 256kbps per participant. For example, if you have 10 participants, you should ensure that you have approximately 5Mbps available in the meeting room. 30 Participants would require nearly 10Mbps.

You should also confirm that the latency to your Internet provider's gateway is acceptable (<30ms), the jitter is low (<10ms) and the packet loss is low (<2%).

Most hotels and meeting venues do not have appropriate bandwidth. The connection should be checked well ahead of your scheduled meeting to ensure there is enough bandwidth during the time period in which you will be joining meetings. Don't rely on bandwidth measured in a hotel at noon vs. 9pm, as the hotel's Internet access will have dramatically higher utilization in the morning and evenings. Business centers, meeting facilities or other locations may have different peak times. You should ask your venue or ISP for details.

Using a **wired Ethernet connection** for the computers that will be used for audio, video and presentations is highly recommended. This will reduce issues related to poor Wi---Fi installations. You should also turn off the Wi---Fi radio on these computers to ensure the Ethernet connection is utilized.

## Physical Room Layout

The layout of the meeting room is important in order for everyone to actively participate in the meeting. It is suggested that you keep the following points in mind when selecting and setting up the venue:

1. Allow for plenty of time to set up and test the equipment prior to your first meeting.

2. Each attendee will need at least one power port. You should request information from the venue's engineering staff on how to not overload the electrical circuits. Remember that laptop computers can draw up to 2 Amps at 120v (or 1 Amp at 240v) when charging their batteries, so plan for this in your power budget.

3. Heating and cooling can be a major factor. Make sure you know where the thermostat is or who to ask in order to adjust it. If you will be in the location overnight due to an overseas meeting, keep in mind that some offices and venues shut down the heating or cooling systems at night and you should check this prior to the event. Also take note that projectors and TVs can add to the room's heat.

4. Take note of the location and quantity of the power and network connection points.

5. An example layout for up to 15 individuals is in Appendix A

## Audio

A sound system that is properly sized to the audience you expect is important. This will allow everyone to hear the local and remote audiences, speakers and presenters.

If you are expecting a large audience, you should consider using a robust audio system that includes the following:

1. One or more wired or wireless microphones. Microphones with on/off switches have been found to work the best, as they don't require adjusting the audio mixer each time they need to be used. USB Audio device is really useful.

2. Speakers and amplifiers as appropriate for the room.

3. One computer to run the Hub feed using Skype, Facetime, Google Hangouts, Adobe Connect, WebEx etc.

4. Appropriate cables to attach all of the above together that includes: o 1/8" stereo phono to 1⁄4" or XLR Male cables. o 25' XLR Male to Female cables to attach the microphone(s) to the mixer and the mixer to the speakers or amplifiers.

5. A qualified technical person to install and operate the above equipment throughout the duration of the meeting.

Audio block diagram is in Appendix B.

## Video

A video feed is available in some rooms. You may be able to access this video feed by using the Adobe Connect link listed on the meeting webpage and displaying the feed in full---screen to a projector or plasma.

You will need a dedicated computer to display this feed in full screen mode (multiple full---screen displays will not work with the Adobe Connect software).

Remember to use Ethernet and not Wi---Fi in order to ensure the best possible connection for this computer.

## Presentations

Presentations are shared from within Adobe Connect and can be displayed in a similar manor to the video feeds above. You may display the presentation in full screen on a separate monitor or projector than the video feed. If you will be displaying the presentation in full screen mode, you will need to use a separate computer than the video feed computer above.

Remember to use Ethernet and not Wi---Fi in order to ensure the best possible connection for this computer.

## Tips and Suggestions

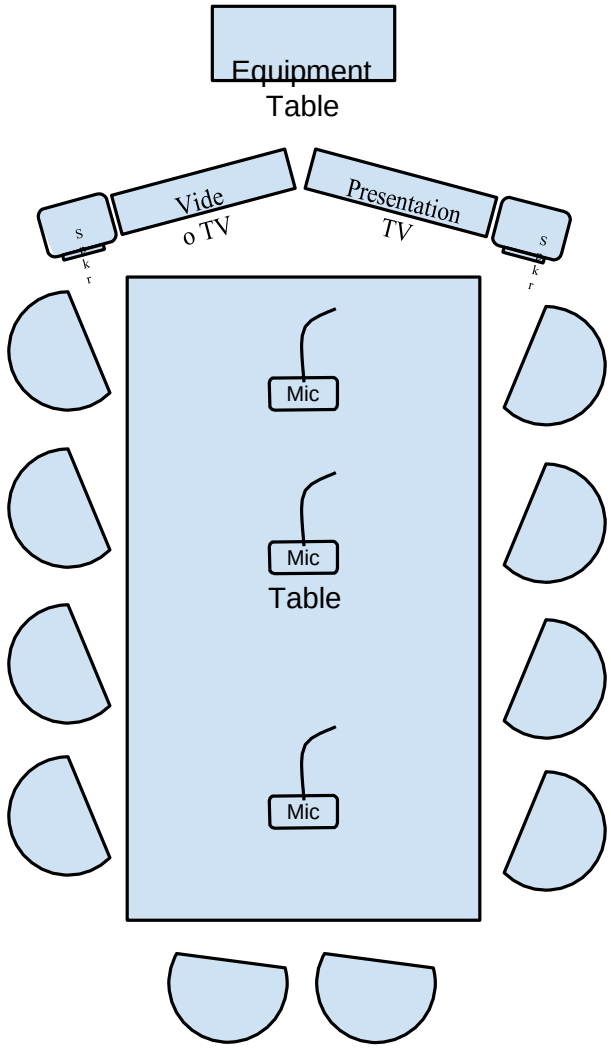
1. You must mute or turn down the volume on any computers that individuals at the table are using. If they were to join the Adobe Connect room, it could cause an echo that will loop back to the remote meeting.

2. You must have a qualified audio engineer to assist with the setup and operation of this equipment. Not having a knowledgeable engineer on---site is a recipe for disaster if you are using audio mixer and other audio devices.

3. Test early and test often. Make sure that you test your equipment at the beginning of each day. Plan on at least one hour to test and fine---tune the audio connections prior to your scheduled meetings.

## Appendix A

Example remote participation design for 15 participants. (Diagram is for reference only, Subjected to change depending upon the requirements)




**Suggested Equipment**

1 Plasma/LCD/LED TV's
1 Computer to run Adobe Connect or Webex for presentation sharing
1 camera
1 Small mixer
2 Amplified Speakers
3 Microphones
Cables as necessary to connect devices

***Bi---directional hubs will also require the following additional equipment:***

*1 Computer to run bi---directional audio/video*
*1 Plasma/LCD/LED TV's*

## Appendix B

Example audio block diagram. (Diagram is for reference only, Subjected to change depending upon the requirements)