Video Conferencing Solutions: The Definitive Guide(A to Z)

VIDEO CONFERENCING SOLUTIONS
THE DEFINITIVE GUIDE (A to Z)

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WHAT IS

VIDEO CONFERENCING?

Live real time, visual communication session between two or more users residing in separate locations.

This technology enables business meetings, routine meetings, business deals, and even interviews between different offices/branches located at far locations. Its use cases are endless, as it saves a lot of time, cost, and hassle associated with business travel.

Lately, many organizations have also implemented Video Conferencing to such an extent that it has become their preferred mode of communication over a direct telephonic call or audio conferencing.

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BENEFITS

OF USING VIDEO CONFERENCING

- ✓ Increase in productivity and efficiency of employees
- ✓ Lower travel costs (No need for physical presence)
- ✓ Reduce time to market by connecting stakeholders instantly for more productive discussions
- ✓ Engage more productively with the remote workers by seeing them more frequently
- ✓ Communicating face-to-face sends an indirect message(emotions, hand/body gestures and body language) before you say a word.
- ✓ Host informative/educative sessions and provide employees training through materials visually and more quickly

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VIDEO CONFERENCING

VS

VIDEO COLLABORATION

Video Conferencing is all about enabling video and audio communication between two or multi-parties.

Video Collaboration is video call along with sharing of documents, presentation materials, whiteboards, and similar group presentation visual aids.

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BASIC COMPONENTS

OF VIDEO CONFERENCING INFRASTRUCTURE

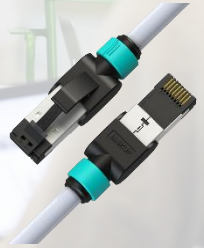
DISPLAY

SPEAKER

CAMERA

MIC

PROCESSOR
(CODEC)



NETWORK

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DISPLAY

- ✓ Depends upon your requirement, size of your conference room, usage frequency, surround lighting and your budget.
- ✓ Single Display vs Dual Displays (one for video meeting and other for Data sharing),
- ✓ 4K option (Nowadays, some VC systems also support 4K resolution)

SPEAKER

- ✓ Integrated speaker of TV
- ✓ Integrated speaker of customized VC solution
- ✓ Additional audio speaker as per the room size

CAMERA

- ✓ HD Camera Pan, tilt and zoom camera for up to 4k UHD capture (Commonly known as PTZ cameras)
- ✓ 20x/12x/4x zoom options
- ✓ Wide viewing angle: 65-degree view, 85-degrees view, etc.
- ✓ Facial-tracking to accurately frame all room participants (aka auto-framing or smart-framing) or focus on the person speaking

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MIC

Here also, OEMs provide their own Mic with different specs, like- 360-degree coverage, 22 kHz of high-fidelity audio. There are two types of mic available:

- ✓ Table Top (Unidirectional)
- ✓ Ceiling Mic

PROCESSOR (CODEC)

A processor/codec is a device or algorithm for encoding or decoding a signal with the help of pre-defined protocols. These codecs are necessary to encode and decode audio, video and data streams to network. There are 3 main categories of protocols:

- ✓ Audio
- ✓ Video
- ✓ Data Control

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VIDEO CONFERENCING PROTOCOLS

H.320

H.320 is a protocol for Circuit-Switched Network that includes its signaling mechanisms and how voice, video and other payload are transmitted over ISDN (Integrated Services Digital Network) interface.

H.323

H.323 is a signaling protocol that defines packet-switched network operating on IP based networks.

SIP

SIP (Session Initiation Protocol) is a transfer protocol, which describes a method for establishing and terminating user online session, including multimedia content exchange (video and audio conferencing, instant messaging, online games).

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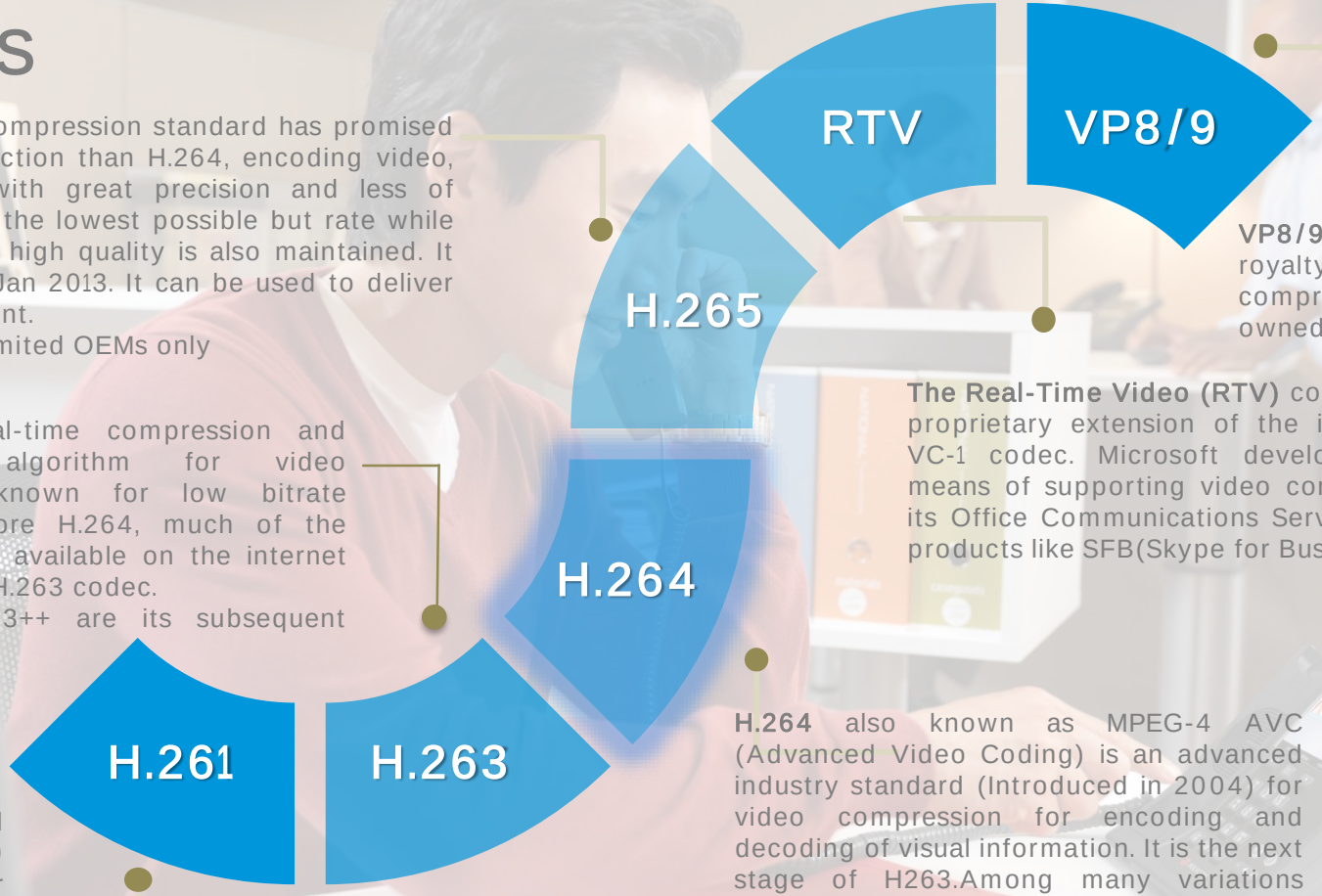
CODECS

H.265 - a video compression standard has promised 50% storage reduction than H.264, encoding video, motion vectors with great precision and less of residual errors, at the lowest possible but rate while at the same time, high quality is also maintained. It was approved in Jan 2013. It can be used to deliver 4K premium content.
But it is used by limited OEMs only

H.263 It's a real-time compression and decompression algorithm for video communication, known for low bitrate compression. Before H.264, much of the streaming content available on the internet was based on the H.263 codec.
H.263+ and H.263++ are its subsequent versions.



H.261 - published in ITU-T in 1990 and targeted for circuit switched networks (ISDN).

VP8/9 is an open and royalty free video compression format owned by Google

The Real-Time Video (RTV) codec is Microsoft's proprietary extension of the industry-standard VC-1 codec. Microsoft developed RTV as a means of supporting video conferencing within its Office Communications Server generation of products like SFB(Skype for Business)

H.264 also known as MPEG-4 AVC (Advanced Video Coding) is an advanced industry standard (Introduced in 2004) for video compression for encoding and decoding of visual information. It is the next stage of H263.Among many variations following are its most common profiles:

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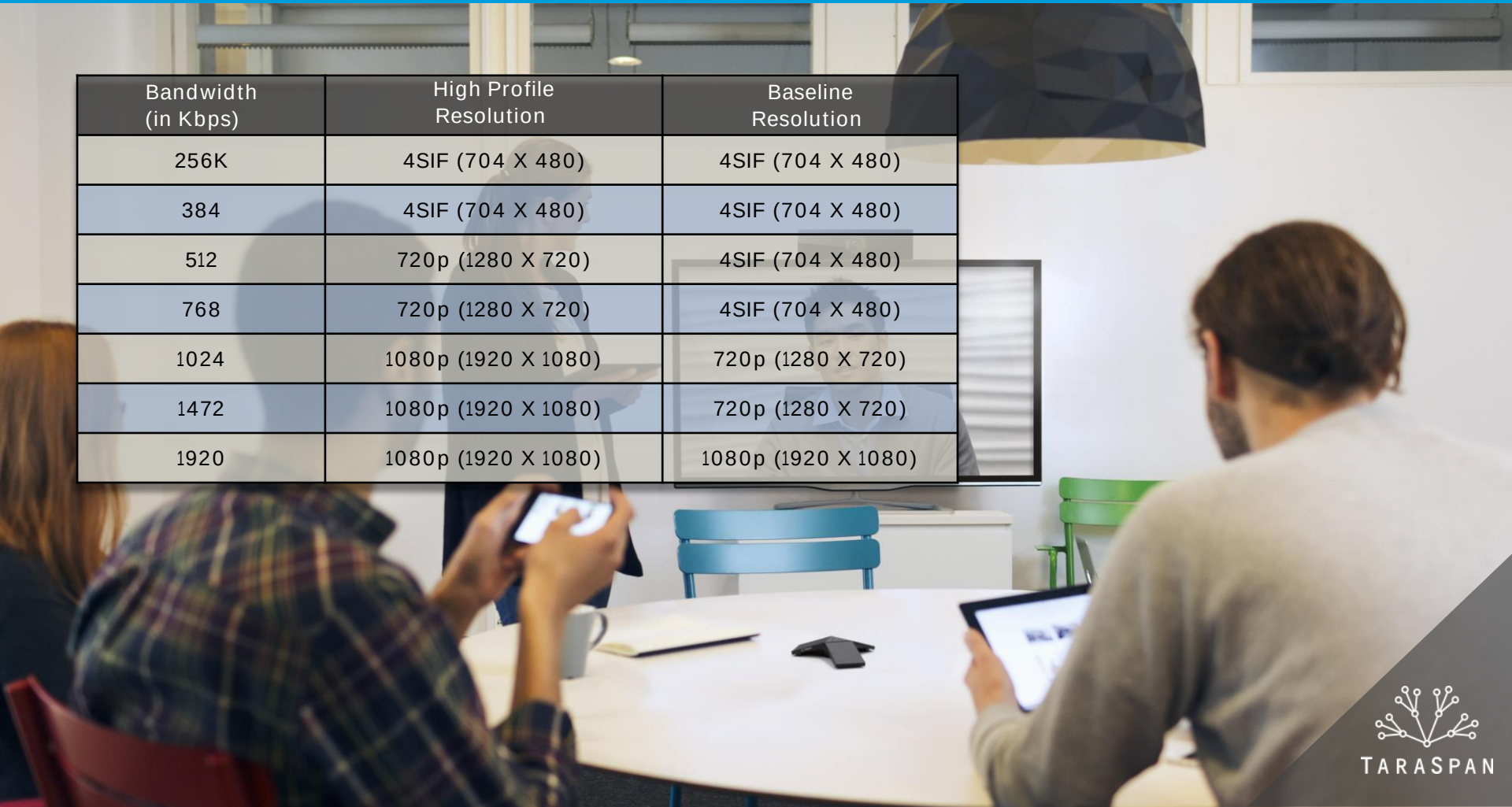
Bandwidth (in Kbps)	High Profile Resolution	Baseline Resolution
256K	4SIF (704 X 480)	4SIF (704 X 480)
384	4SIF (704 X 480)	4SIF (704 X 480)
512	720p (1280 X 720)	4SIF (704 X 480)
768	720p (1280 X 720)	4SIF (704 X 480)
1024	1080p (1920 X 1080)	720p (1280 X 720)
1472	1080p (1920 X 1080)	720p (1280 X 720)
1920	1080p (1920 X 1080)	1080p (1920 X 1080)



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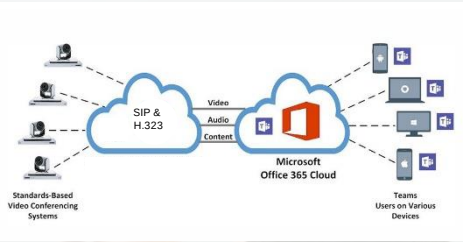
ADVANCED COMPONENTS/ FEATURES

OF VIDEO CONFERENCING INFRASTRUCTURE

NATIVE INTEGRATION WITH 3RD PARTY APPS

CONTENT SHARING DEVICE



INTEROPERABILITY

VIDEO RECORDING

EVENTS/ WEBINAR HOSTING

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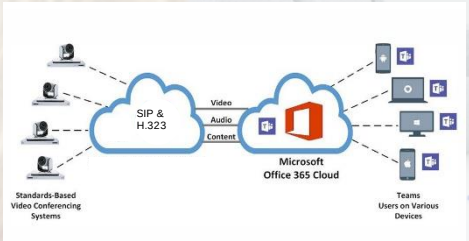
✓ NATIVE INTEGRATION WITH 3RD PARTY APPS

Provides integration with Microsoft Skype for Business, Outlook and other business tools.

✓ CONTENT SHARING DEVICE

You can share content wirelessly by using this addon. Connect multiple laptops to share screen to participants.



✓ INTEROPERABILITY

It is the capability of system to operate with other vendor products. It removes the barriers between different video conferencing software systems, platforms, and devices.

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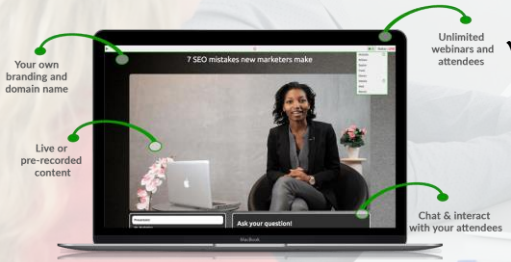
✓ VIDEO RECORDING

Some systems provide USB capability to record complete video streaming (Incoming and Outgoing) along with audio, and others have an inbuilt feature to record on cloud or any other location.



✓ EVENTS/WEBINAR HOSTING

Some tools allow the broadcasting video to a large audience, thus addressing the need of engagement up to 15,000 attendees with immersive video, Q&A, polling, and large meeting control.

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BASED ON CAPABILITY

VIDEO CONFERENCING SOLUTIONS

ON-PREMISE

POINT-TO-POINT

MULTIPOINT

MULTIPOINT CONTROL UNIT

CLOUD-BASED

DESKTOP/MOBILITY

CLOUD-BASED

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ON-PREMISE

✓ **POINT-TO-POINT VIDEO CONFERENCING:**
Designed for two parties in a one-on-one situation, both parties can talk from different locations.

✓ **MULTI-POINT VIDEO CONFERENCING:**
Up to 8-24 people (number depending upon OEM) can join meeting at the same time.

✓ **MULTIPOINT CONTROL UNIT (MCU):**
For more than 8-24 parties, MCU is required. It consists of a video-networking bridge.

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CLOUD-BASED

✓ **DESKTOP/MOBILITY SOLUTIONS:**
Desktop/Mobility solutions provide full video conferencing capabilities on desktop, tablets & smartphones.

✓ **CLOUD-BASED SOLUTIONS:**

- Up to 100 attendees per meeting
- Internal and External, no additional hardware
- Any Device: room system, tablet, mobile, PC, MAC
- Stream out live to Facebook & Workplace
- Easily Scalable

Join meetings from Cisco, Polycom, Lifesize & other H.323 and SIP-based room systems.

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ON-PREMISE: GOOD VS BAD

VIDEO CONFERENCING

THE GOOD:

- ✓ ***Security & Privacy of Infrastructure***
  On-premise VC is the correct model to deploy for the risk-averse organizations, having security issues.

- ✓ ***Video Recording***
  On-premise VC is a viable option for keeping the recordings safe, which are mission-critical to the business.

THE BAD:

- ✓ ***Limitations to Connect Many Users***
  It allows a limited number of users to connect (approx. 8-24). MCU enables more users at very expensive rates.

- ✓ ***Lack of Interoperability***
  Hurdles are present in connecting between two intra-office locations due to manufacturer differences, protocols, and infrastructure setup.

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CLOUD-BASED: GOOD VS BAD

VIDEO CONFERENCING

THE GOOD:

- ✓ ***Interoperability & Scalability***
  It eradicates hardware limitations and enables boundary-less communication with scale- 1 to 100 users according to the needs.

- ✓ ***Network Management***
  Enjoy the benefits of updated software, address books, & network issues are also proactively managed.

- ✓ No Specialized Staff Needed to Maintain Equipment

THE BAD:

- ✓ ***Third-Party Involvement***
  Sensitive information may be compromised irrespective of how many strict security regulations are followed.

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BASED ON ROOM SIZE

VIDEO CONFERENCING SOLUTIONS

PERSONAL VC

SMALL ROOMS OR HUDDLE MEETINGS

MID-SIZED VC

LARGE OR BOARDROOM CONFERENCES

IMMERSIVE VC

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→ SOLUTIONS (BASED ON ROOM SIZE)

PERSONAL VC SOLUTIONS

✓ Home, workspace, or faraway- meet with your people face-to-face easily using your own personal device at your own convenience.

SMALL ROOMS OR HUDDLE MEETINGS

✓ An integrated VC solution with all-required software to deliver unparalleled meeting experience for small workplace.

MID-SIZED VC SOLUTIONS

✓ It includes workforce collaboration solutions with enterprise-level conferencing approaches to be accommodated in the meeting spaces.

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→ SOLUTIONS (BASED ON ROOM SIZE)

LARGE OR BOARDROOM CONFERENCES

✓ Coupled with highest quality voice, video, and content sharing, these solutions are specifically designed to meet every need of all executives.

IMMERSIVE VC SOLUTIONS

✓ Get lifelike collaboration experience with flawless elements- whether it is video quality or voice or content sharing- in meeting of lower to higher importance.

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ROOM DESIGN AND LAYOUT GUIDELINES

OF VIDEO CONFERENCING

An ultimate experience of video conferencing requires room and environment to be optimally designed for that particular purpose. Various factors, like Interior designing, furniture, acoustics, room lightning affect the performance of video meeting.

FURNITURE, INTERIOR DESIGNING & FINISHES

OPTIMAL ACOUSTICS

VIDEO ELEMENTS

ROOM LIGHTNING

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General Room Requirements

You May Need

Here are some of the general room requirements that must be taken into consideration:

- ✓ Ceiling tiles should be high-quality acoustic tiles about 1” thick compressed dense core fiberglass.
- ✓ Blowers, heat exchangers, solenoid valves and other air handling equipments must be kept outside the conferencing room, to avoid unnecessary noise disruptions.
- ✓ Open, untreated windows may cater to unnecessary distractions of noises and light, which may interrupt in the conferencing. Thus, it is important to put heavy weight drapes of about 24 ounces for a seamless video call.

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FURNITURE

- ✓ Tables or any sort of furniture present in the room must have a light, top surface while glossy top surfaces must be avoided at all costs in order to avoid any ill visible effects.
- ✓ Flat satin finish in neutral gray is considered to be the best table surface color.
- ✓ Doorways must be within the camera view in order to avoid the perception of the people at the far end that people do not come into the meeting room unseen.
- ✓ The furniture must be placed in accordance with the video conferencing system and it must not interrupt in the interaction of the conference participants.
- ✓ You may also use a table covering of appropriate color in case the worst possible table surfaces.

INTERIOR DESIGNING AND FINISHES

- ✓ If video conferencing is held in the room with marginal lighting, in that case, you must wear slightly dark-colored clothes and a slighter darker color on the walls would help to serve the purpose.
- ✓ Generally, light gray color with a touch blue seems to make a favorable combination.
- ✓ In case when there is a slight difference between the room background and the reference image color, the codec easily turns the images into numbers with the result that the person at the far end will be able to experience video conferencing of much higher quality.
- ✓ Keeping in mind some of these color recommendations, acoustic panels must be ordered in light colors such as silver-gray, quartz or champagne within the camera field of view.

OPTIMAL ACOUSTICS

Video conferencing room should be built in order to achieve a low noise rating. This is because a quieter room would make it easier to hear each other's voices clearly and to the other participants in the far-end location.

- ✓ It is important to cover about 50% of the walls with acoustic panels to prevent the voice of the meeting room to leak into the adjoining hallways or offices.
- ✓ Every conference room of medium to large size must be given acoustic treatment for a quality speech-rendering to other conference sites.
- ✓ Treated surface must include about two non-parallel walls. Moreover, the treated wall must have a wall immediately behind the video system since VC hardware causes constant disturbances of fan noises.

VIDEO ELEMENTS

- ✓ Size of the display used in video conferencing environment depends on the number of attendees, the physical distances between the participants and on the type of material presented on screen.

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ROOM LIGHTNING

It is necessary to keep a check on the brightness of lightning in the video-conferencing room, in order to determine the far-end view of the meeting.

- ✓ In case of low to moderate lightening (20fc to 35 fc, where fc refers to footcandles), the range of in-focus objects is about 2’ or 3’ from nearest in-focus to furthest in-focus.
- ✓ On the case of bright light(70fc or more) in the video conferencing room, the distance range of the objects in-focus, doubles, which implies that the people at the far-end will be able to see more people in-focus and have a clearer view.
- ✓ Use indirect lighting for 80-85% of the light which helps in minimizing shadows on the face of participants, and evenly distributed direct lighting for the remaining 15-20%. The direct light creates backlight separation between foreground and background objects or surfaces.
- ✓ As viewed by camera, there should be not less than 55fc and ideally as much as 75fc of light (770lux) on the faces of the participants in the facial field.

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About TaraSpan

At TaraSpan, we deliver the most reliable, comprehensive and best-in-class Business Communication & Collaboration and Networking & Security solutions that transform the way you do business. We help you drive innovation in your business by delivering ultimate client collaboration experience and providing unparalleled level of services across IP telephony, Unified Communications, Contact Center Solutions, Video Conferencing, Mobility Enterprise Solutions and Data Center Solutions.

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