Cisco Meeting Server

Administrator Quick Reference Guide

Screen Layouts, Pane Placement, and Customizable Layouts

Version 3.4

December 15, 2021

Contents

Change History 4

Introduction 5

Layouts on web app and SIP endpoints 6
- Layouts on SIP endpoints 6
- Layouts on web app 6
- Available layouts 7
  - automatic 8
  - allEqual 8
  - stacked 9
  - telepresence 9
  - SpeakerOnly 10
  - onePlusN 10
- Using Meeting Server APIs to select a layout 11
- Using DTMF to select a layout 12
- Using ActiveControl to select a layout 13

Importance levels of participants 14
- Setting importance using the Meeting Server API 14
- Using importance 15

Pane sequence 16

Pane placement 19
- Active speaker in pane placement 20
- Considerations when deploying pane placement 20
- Using the API to set pane placement 20
  - Setting pane placement on spaces and active calls 21
  - Removing pane placement 23
- Using API to enable active speaker in pane placement 24
  - Enabling active speaker in pane placement 24
- Using the API to set the Self pane mode 26
- Placing panes on single screen endpoint systems 30
  - panePlacementHighestImportance matches number of panes in screen layout 30
  - panePlacementHighestImportance greater than number of panes in screen layout 31
  - panePlacementHighestImportance smaller than number of panes in screen layout 31

The effect of self pane mode 32
Participant has higher importance than panePlacementHighestImportance set on the space/call 33
One speaker to many listeners 35
Placing panes on multiple screen endpoint systems 36
Example of using Pane Placement 38

More video streams over distribution links between clustered Call Bridges (preview feature) 42

Panoramic video layouts (Beta support) 43
Web interface change 43

Customizable Layouts 44
Licensing for using customizable layouts 44
How to implement customizable layouts 45
API failure reasons 45
Setting / overriding a layout template on a call leg 46
Overriding a layout template on a participant 46
Getting information for the layout template on an active call leg 46
Turning off a customized layout template 46
JSON text file customizable layout example 47
API access on the web interface 49

Cisco Legal Information 51

Cisco Trademark 52

Change History

Date	Change Summary
December 15, 2021	New release of Cisco Meeting Server 3.4 software
August 24, 2021	New release of Cisco Meeting Server 3.3 software
September 07, 2020	Clarification note regarding triple screen endpoints added to Introduction.
April 08, 2020	New release of Cisco Meeting Server 2.9 software Introduction of: panoramic video layouts, API access using the web interface.
November 13, 2019	New release of Cisco Meeting Server 2.8 software
October 25, 2019	Minor addition
August 12, 2019	New release of Cisco Meeting Server 2.7 software.
August 06, 2019	Title change to versions 2.4, 2.5 and 2.6.
July 31, 2019	Minor corrections and restructuring
October 02, 2018	Minor corrections
September 21, 2018	First released

Introduction

This Quick Reference Guide pulls together related information on:

- the screen layouts supported on SIP endpoints and web app by the Cisco Meeting Server. It also covers the layouts supported on Cisco Meeting Management. It does not cover layouts supported on Lync or Skype for Business clients or other third party products.
- setting the importance levels on participants to determine who will be displayed.
- pane sequence for different screen layouts.
- the pane placement feature to control which participant appears in which pane on an endpoint. Examples are provided on using Pane Placement for different screen layouts both on single screen endpoints and multiple screen endpoints.
- setting the number of video streams from remote Call Bridges in clustered deployments.
- the customizable layouts feature to allow more flexibility to create and apply custom layout templates to conferences (from version 2.8).

Note: Pane placement on the Meeting Server applies conference wide, and is not configurable per participant.

Note: Where this guide refers to triple screen endpoints, it means endpoints that support TIP such as the IX (not endpoints that are not TIP capable and utilize 3 screens). Therefore references to triple screen (as it relates to Pane Placement or Layouts, for example) do not apply to endpoints that do not support TIP but support the use of 3 screens or displays such as SX80 or Codec Pro.

Layouts on web app and SIP endpoints

The section discusses the screen layouts available for web app and SIP endpoints and the methods that can be used to configure.

Layouts on SIP endpoints

Screen layouts for SIP endpoints are selected via the Meeting Server API, Cisco Meeting Management, by using DTMF tones if they are configured through the API, or through ActiveControl on endpoints supporting the protocol. Using the Meeting Server API or Cisco Meeting Management, the administrator or video operator can select the screen layout for a single participant or for all participants in a conference.

Points to note:

- The Active speaker is indicated by a blue line below the speaker's pane.
- Set the number of remote video streams per remote Call Bridge in a clustered deployment to 1, 4 or 9; the default is 4 (note that 9 remote video streams across distribution links between clustered Call Bridges is still a preview feature). See here for more information.

Layouts on web app

Web app supports its own layouts and can be selected by the participants during the meeting to suit their viewing experience. Screen layouts for web app can also be selected via Meeting Server or Meeting Management. Dynamic, fixed, and customized layouts and pane placement of participants can be configured using Meeting Server and Meeting Management for web app participants.

Web app supports adaptive layouts that change based on how many people are in the meeting and the size and aspect ratio of the web app window. For example, if it is displaying 4 participant it could display one row of four, two rows of two or one column of four depending on the size and aspect ratio of the window. For most meetings, this allows the end user to decide what they want to see and is the best end user experience. However, for scenarios where a more fixed experience is required, administrators can force the web app to have the same fixed 16:9 aspect ratio layout for all the participants. For example, you can use pane placement and ensure that everyone saw a 3 x 3 equal layout showing the same participants.

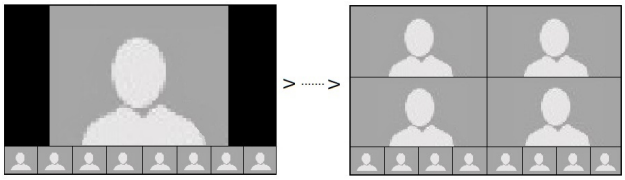
When Meeting Server API or Meeting Management configure a dynamic layout which changes as more participants join, web app chooses its own layout – either All Equal or Speaker Large – which might result in a minor difference in layout between web app and SIP endpoints.

Available layouts

Layouts available through the Meeting Server API are listed below, with the equivalent name used in other interfaces:

Layouts in Meeting Server	Layout displayed as on web app	Layouts
	Speaker Only	speakerOnly also known as full screen on the Meeting Server Web Admin interface, and Single on Cisco Meeting Management and selected endpoints,
	All Equal	allEqual also known as Equal on Cisco Meeting Management and selected endpoints,
		allEqualQuarters
		allEqualNinths
		allEqualSixteenths
		allEqualTwentyFifths
	Speaker Large	stacked also known as stack on the Meeting Server Web Admin interface,
		telepresence displayed as Speaker Large on the web app and Overlay on the Meeting Server Web Admin interface, Cisco Meeting Management and selected endpoints,
		onePlusN also known as Prominent on Cisco Meeting Management and selected endpoints,
		onePlusFive
		onePlusSeven
		onePlusNine
	Speaker Large	automatic + no layout template is configured automatic also known as Auto on Cisco Meeting Management and selected endpoints,
	Custom	automatic + layout template is configured

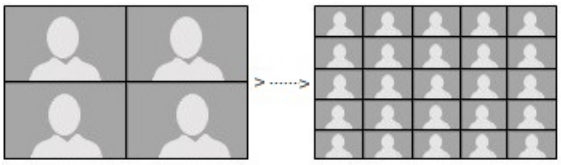
automatic



`automatic` layout is based on recent active speakers with the following rules applied:

- participants will be shown in "big panes" when they become the active speaker.
- recent active speakers will be shown in big panes, with other participants shown in a "dock" of smaller Picture in Picture (PiP) panes at the base of the screen.
- people will move out of the "active speaker list" (and thus be "demoted" to the dock) after a period of inactivity (not speaking).
- if there is only one other video stream to be shown then it will be shown full screen, "point to point" mode.
- the maximum number of participants that will be visible are the 4 loudest speakers plus a maximum 8 participants in the dock (total 12 participants).
- called **Auto** on Cisco endpoints running CE 9.1.4, and Cisco Jabber version 12.5.
- called **Auto** on Cisco Meeting Management.
- displayed as a onePlusN layout on dual screen endpoints.
- on web app, displayed as Speaker Large when no customized layout template is configured and as **Custom** when a customized layout template is configured.

allEqual

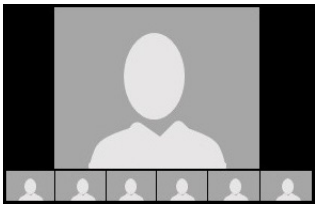


- the layout expands from a 4 person (2 x 2) view up to a 25 person (5 x 5) view, with all participants shown at equal size.
- displayed as "**all equal**" on the Web Admin interface (**Configuration > Space configuration > Default layout**) and "**All Equal**" on the web app.
- called **Equal** on Cisco endpoints running CE 9.1.4, and Cisco Jabber version 12.5. Accessible using Touch 10 or a remote control.
- displayed as **Equal** on Cisco Meeting Management.

- if there is only one other video stream to be shown then it will be shown full screen, "point to point" mode.
- alternatively, a specific allEqual fixed layout can be specified from:
  - allEqualQuarters
  - allEqualNinths
  - all EqualSixteenths
  - allEqualTwentyFifths

Note: For dual screen endpoints there is a limit of **allEqualNinths**. If **allEqualSixteenths** or **allEqualTwentyFifths** are selected then the selection is ignored and the layout on the endpoint will revert to **allEqualNinths**.

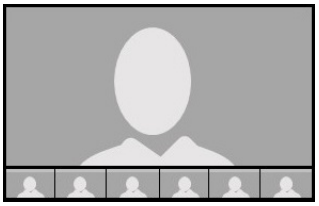
stacked



- this layout shows a maximum of 6 PiPs below the main speaker, even if there are more than 7 other callers in the meeting. The PiPs are separate to the main speaker pane.
- if there is only one other video stream to be shown then it will be shown full screen, "point to point" mode.
- displayed as "**stack**" on the Web Admin interface (**Configuration** > **Space configuration** > **Default layout**).
- displayed as "**Speaker Large**" on web app.

Note: This layout cannot be selected using Touch 10 or a remote control.

telepresence



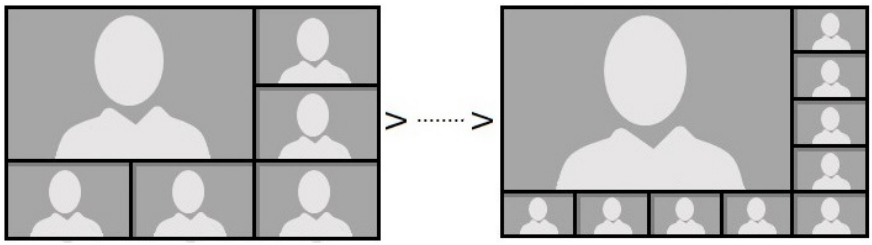
- this layout shows a maximum of 6 PiPs below the main speaker, even if there are more than 7 other callers in the meeting. The PiPs are overlaid at the bottom of the main speaker pane.

- if there is only one other video stream to be shown then it will be shown full screen, "point to point" mode.
- displayed as "**overlay**" on the Web Admin interface (**Configuration** > **Space configuration** > **Default layout**) .
- displayed as "**Speaker Large**" on web app.
- called **Overlay** on Cisco endpoints running CE 9.1.4, and Cisco Jabber version 12.5. Accessible using Touch 10 or a remote control.
- displayed as **Overlay** on Cisco Meeting Management.

SpeakerOnly

- only the single loudest speaker is visible.
- displayed as "**full screen**" on the Web Admin interface (**Configuration** > **Space configuration** > **Default layout**).
- displayed as "**Speaker Only**" on web app
- displayed as **Single** on Cisco Meeting Management.
- called **Single** on Cisco endpoints running CE 9.1.4, and Cisco Jabber version 12.5. Accessible using Touch 10 or a remote control.

onePlusN



- automatically changes the screen layout on SIP endpoints as participants join or leave a meeting. For example from onePlus5 to onePlus7 to onePlus9.
- if there is only one other video stream to be shown then it will be shown full screen, "point to point" mode.
- displayed as **Prominent** on Cisco Meeting Management.

- called **Prominent** on Cisco endpoints running CE 9.1.4, and Cisco Jabber version 12.5. Accessible using Touch 10 or a remote control.
- alternatively, a specific onePlusN layout can be specified from:
  - onePlusFive
  - onePlusSeven
  - onePlusNine
- displayed as "**one plus five**" etc. on the Web Admin interface (**Configuration** > **Space configuration** > **Default layout**)
- displayed as **Speaker Large** on web app.

Note: For dual screen endpoints, selecting **onePlusN** will display either 1+2x2, 1+3x3 or 1+4x4 layout depending on the number of participants in the conference and the setting for **`panePlacementHighestImportance`**.

Using Meeting Server APIs to select a layout

The web app and SIP endpoint users can change the layout based on the permissions assigned to them through the **`changeLayoutAllowed`** parameter on **`callLegs`**.

The following parameters can be configured to select a screen layout for web app and SIP endpoints.

The **`defaultLayout`** parameter is supported on the following API nodes:

- POST to **`/coSpaces`**
- PUT to **`/coSpaces/<coSpace id>`**
- POST to **`/calls/<call id>/participants`**
- POST to **`/calls/<call id>/callLegs`**
- PUT to **`/callLegs/<callLeg id>`**
- POST to **`/callLegProfiles`**
- PUT to **`/callLegProfiles/<call leg profile id>`**

The **`chosenLayout`** parameter can be used to change the layout during the call and is supported on the following API nodes:

- POST to **`/calls/<call id>/callLegs`**
- PUT to **`/callLegs/<callLeg id>`**
- GET on **`/callLegs/<callLeg id>`**

The **`layout`** parameter is supported on GET on **`/callLegs/<callLeg id>`** to retrieve the layout selected in web app or the SIP endpoint.

Note: The **`defaultLayout`** setting for **`/callLegProfiles`** will be inherited if **`defaultLayout`** is left blank for **`/coSpaces`**, **`/calls`**, **`/callLegs`**. If both **`defaultLayout`** and **`layout`** are set then **`defaultLayout`** takes precedence.

Pane placement is enabled by the existing parameters, **`panePlacementHighestImportance`** and **`panePlacementSelfPaneMode`** supported on the following methods:

- POST to **`/coSpaces`**
- PUT to **`/coSpaces/<coSpace id>`**
- POST to **`/calls`**
- PUT to **`/calls/<call id>`**

The **`changeLayoutAllowed`** parameter is supported on the following API methods to assign the permissions to change the layout in web app and SIP endpoints:

- POST to **`/callLegProfiles`**
- PUT to **`/callLegProfiles/<call leg profile id>`**
- POST to **`/calls/<call ID>/callLegs`**
- PUT to **`/callLegs/<callLeg id>`**
- POST to **`/calls/<call id>/participants`**

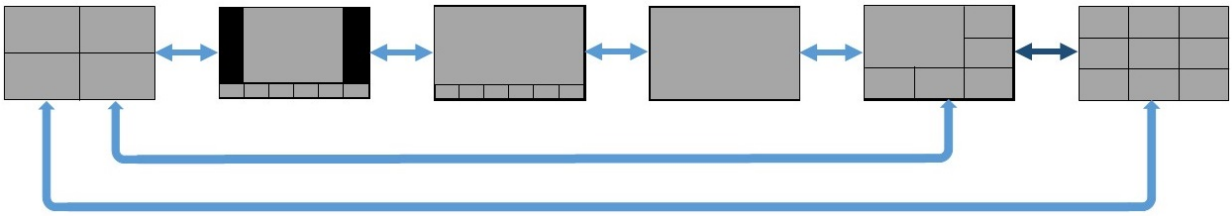
For details on using the API see the Cisco Meeting Server API Reference Guide.

Using DTMF to select a layout

A layout on the SIP endpoint can be selected by DTMF tones if configured through the API. The layouts scroll through in order: allEqual > stacked > telepresence > speaker only > onePlusN > defaultLayout > allEqual > .....

- If the defaultLayout is set to one of these 5 layouts then only these 5 layouts will be in the cycle. For example: if defaultLayout=allEqual then the order is allEqual > stacked > telepresence > speakerOnly > onePlusN > allEqual > .....
- If defaultLayout is set to a different layout to the 5, then the sequence will include the layout set for defaultLayout. For example: if defaultLayout=allEqualNinths then the order is allEqual > stacked > telepresence > speaker only > onePlusN > allEqualNinths > allEqual .....

Figure 1: Using DTMF to scroll through layouts



For details on configuring DTMF, see this FAQ.

Using ActiveControl to select a layout

The Meeting Server automatically supports ActiveControl and will subscribe to the XCCP layout capabilities of an ActiveControl enabled SIP endpoint.

Importance levels of participants

You can use the importance level of participants in a conference to determine who will be displayed on the screen. The importance of participants can be set and reset using either:

- the Meeting Server API (from version 2.2),
- Cisco Meeting Management (from version 1.1),
- web app (from version 1.10).

It is advisable to only use one method to set or reset the importance of participants. As with SIP endpoints, the web app will take into consideration the importance set by the Meeting Server API and by Cisco Meeting Management. Setting the importance of participants within web app will also change the layouts for SIP endpoints. Using both the Meeting Server API and Cisco Meeting Management to set and reset importance, may cause unwanted behaviors and trigger warnings in Cisco Meeting Management.

For information on using web app to set importance, see the web app User Guide. For information on using Cisco Meeting Management to set importance, see the Cisco Meeting Management User Guide for Video Operators. The remainder of this section discusses the impact of setting importance using the Meeting Server API.

Setting importance using the Meeting Server API

Multiple participants can be assigned different importance levels. The participant with the highest importance level will be treated as if they are the loudest speaker. Maximum value for the importance level is 2,147,483,647.

Layouts are built using a list of the assigned importance levels of participants, with highest importance at the top of the list, and within each importance level by the order in which they were most recently the loudest speaker. Layouts are then created by filling panes using this list, with the largest panes filled first. After all panes are filled, panes of equal size may be swapped to minimize people moving within the layout. The sequence that panes are filled is shown here.

For telepresence, stacked, speakerOnly and onePlusN screen layouts, the participant with the highest importance level will be shown in the main pane, rather than the active speaker; if there are multiple participants with the same highest importance level, then one of these will be shown in the main pane, which one being determined by who was the most recent active speaker. The active speaker indication of a blue line below the speaker's video pane remains unaffected.

For the allEqual family of layouts, the participant with the highest importance level will be shown in one of the allEqual panes, but not necessarily pane #1. If there are multiple important participants then up to 25 will be displayed in the allEqual panes, any remaining places will be taken by participants without importance set.

Initially, all participants have an unset importance level, any set importance level is higher than the unset state. An importance level of 1 is higher than 0, but lower than 2, and all these levels are higher than unset.

Note: Although importance level 0 and importance unset currently behave in a similar manner, they are not equivalent, and their behaviors may differ in the future.

Using importance

1. Remove any configured importance settings for all participants in the conference, so all participants are in the unset state.

   PUT to API object **`/calls/<call id>/participants/*`** with request parameter **`importance`** unset (present, but without a value)

2. Add the important person to the conference with the importance level set.

   POST to API object **`/calls/<call id>/participants`** with request parameter **`importance`** set, for example to 1.

3. To make a participant important if they are already in a conference:

   PUT to API object **`/participants/<participants id>`** with request parameter **`importance`** set, for example to 1

Alternatively, an importance value can be assigned to an Access Method for a specific coSpace:

- create a new accessMethod for the specified coSpace, POST to **`/coSpaces/<coSpace id>/accessMethods`** the request parameter **`importance`** set to the chosen value, or
- update an existing Access Method for the coSpace, PUT to **`/coSpaces/<coSpace id>/accessMethods/<access method id>`** the request parameter **`importance`** set to the chosen value.

The effect of Importance is determined by how it is applied:

- if set by applying a PUT method on API object **`/participants/<participant id>`**, the **`importance`** value will only last for the duration of the participants' active connection to the conference
- if set by applying a POST method on API object **`/calls/<call id>/participant`**, the **`importance`** value will only last for the duration of the participants' active connection to the conference
- if set by applying a POST or PUT method on API object **`/coSpaces/<coSpace id>/accessMethod`**, the **`importance`** value will last for the duration of the space, so the same Importance value will take effect if a participant leaves a conference then rejoins using the same **`accessMethod`**.

Pane sequence

The pane position in a screen layout determines the sequence that panes are filled when participants are assigned an importance level. This section shows the pane position in different screen layouts for single screen, dual screen and triple screen endpoints. The numbers indicate the pane position or order of being filled, not an importance value. The pane labelled #1 is filled first, followed by the pane labelled #2 etc.

Figure 2: Pane positions on screen layouts for single screen endpoints

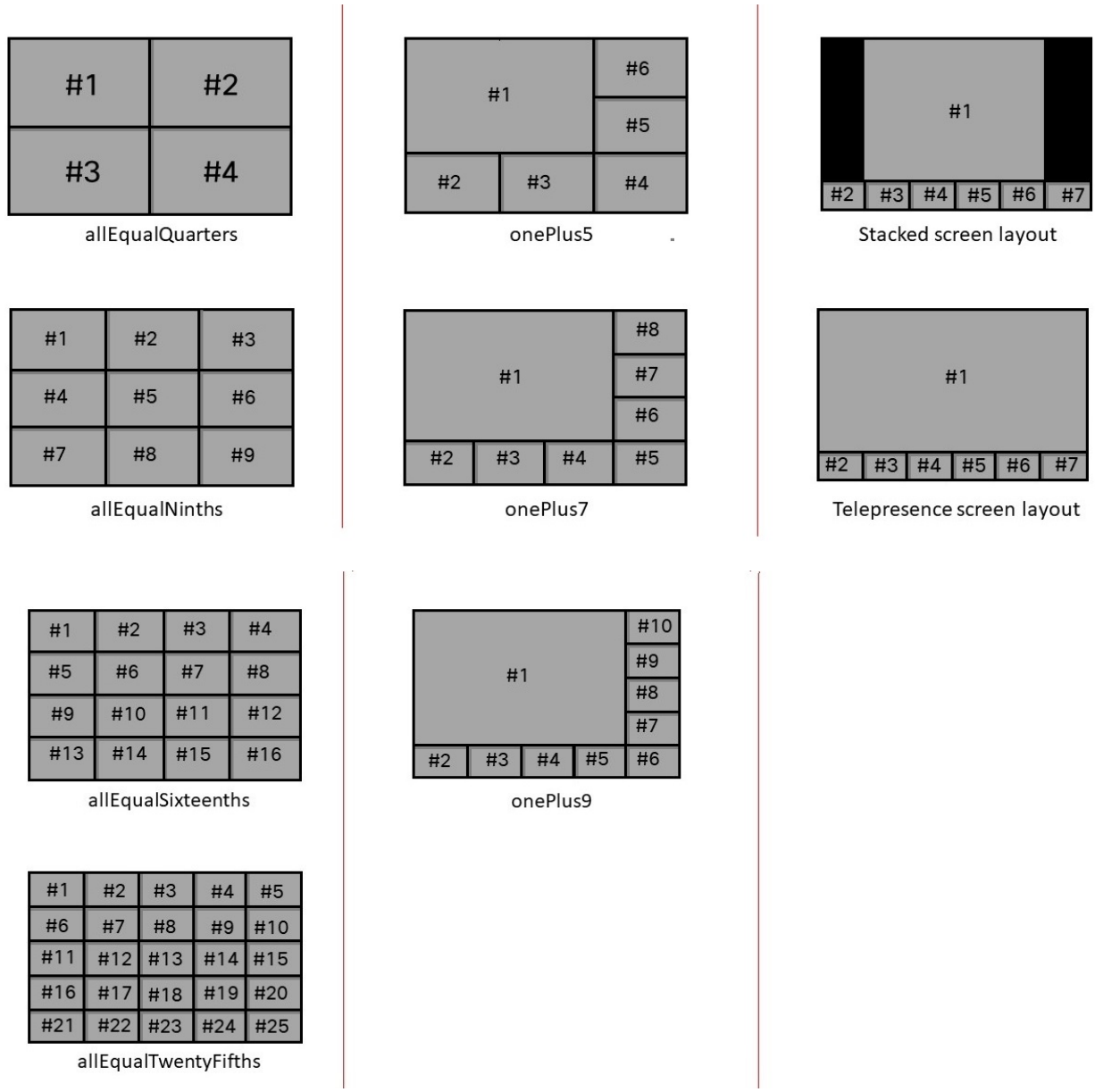
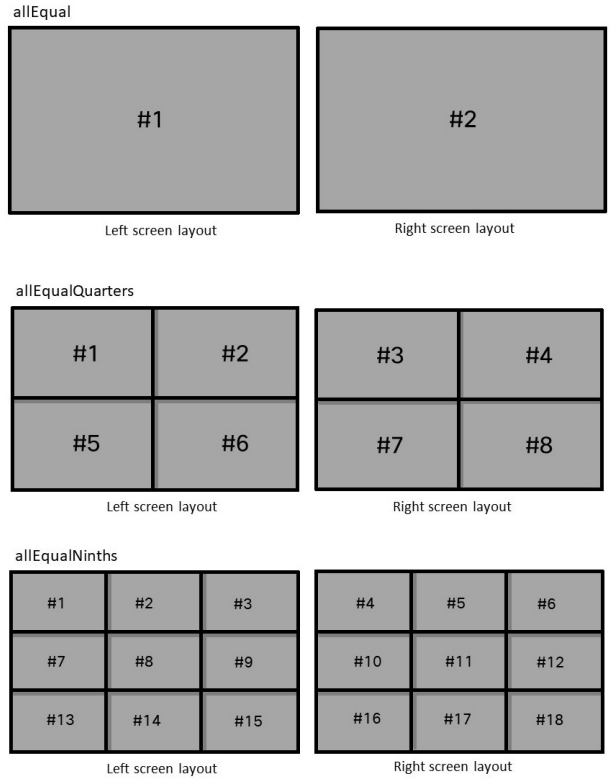
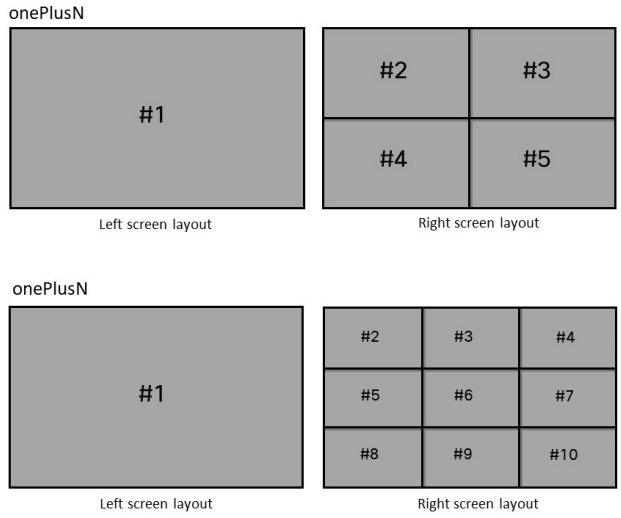


Figure 3: Pane positions on screen layouts for dual screen endpoints



Note: For dual screen endpoints, selecting onePlusN will display either 1+2x2, 1+3x3 or 1+4x4 layout depending on the number of participants in the conference. Automatic layout is displayed as onePlusN on dual screen endpoints.



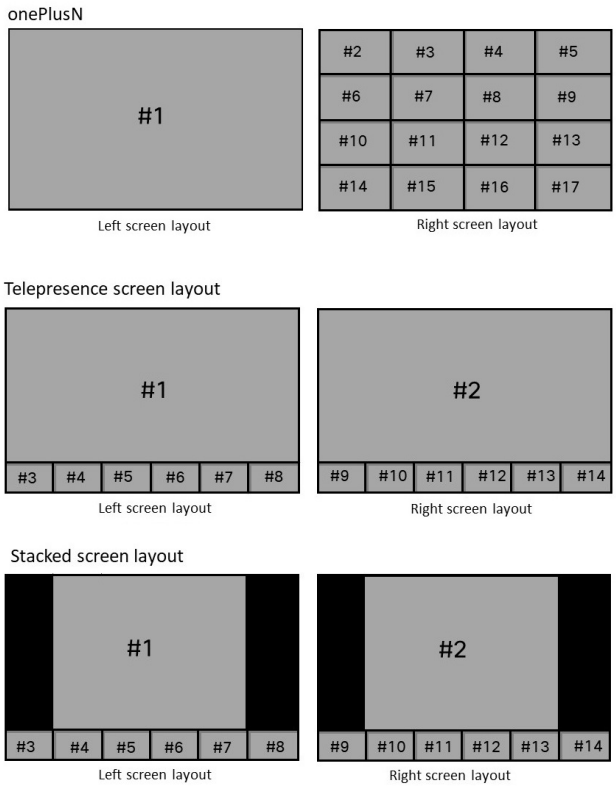
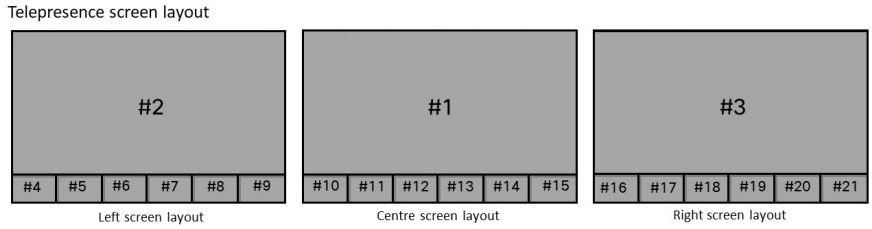


Figure 4: Pane positions on telepresence screen layout for triple screen endpoints

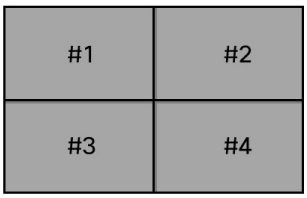


Pane placement

The Meeting Server API pane placement feature enables an administrator to control which participants appear in the panes in web app and SIP endpoints. These conferences can be held within a space, or can be a call hosted on the Meeting Server. It is common practice to combine pane placement with setting the screen layout, and turning off participants' permission to change their screen layout. The screen layout assigned to the endpoints will determine the panes displayed, and the pane position in the layout determines the order of being filled by the video of participants assigned an importance level.

Figure 5 shows the pane positions on an endpoint with the screen layout set to allEqualQuarters; this is a fixed layout so if there are more than four participants, the layout will not change to display more participants. The numbers indicate the pane position or order of being filled, not an importance value. The pane labeled #1 is filled first, followed by the pane labeled #2 etc. For the sequence of filling panes using other screen layouts, click here.

Figure 5: Pane positions using allEqualQuarters screen layout



Pane placement can be set:

- using Cisco Meeting Management and applied to active calls. Cisco Meeting Management does not support pane placement on spaces.
- using the Meeting Server API and applied to active calls in addition to spaces.

Meeting Server offers the ability to control whether the participants with importance set see a pane corresponding to their position in the layout. If enabled, this pane can be set to either show a blank pane or the participant’s own video. This is called the self pane mode in the API and Self-view in Cisco Meeting Management. If left unset, the participants with importance set will not see a pane corresponding to their position in the layout, instead the screen layout skips the self pane and displays the pane of the next important participant. Self pane mode follows the same placement logic as pane placement, but with the addition of showing the Self-view within the pane layout on the important participant's endpoint. Self-view is supported across a Call Bridge cluster.

The remainder of this section covers using the API to set pane placement and the self pane mode. Refer to the User Guide for Video Operators for details on using Cisco Meeting Management to set Pane placement and Self-view.

Active speaker in pane placement

From version 3.3 Meeting Server supports active speaker in pane placement for SIP endpoints and web app.When this feature is enabled, the first pane of the layout is reserved for the active speaker. Since the active speaker is displayed in the first pane, other participants who have been assigned a specific pane using pane placement are moved to the next pane. For example, a participant assigned to the nth pane is displayed in the $(n+1)^{th}$ pane. The active speaker is displayed in the first pane in addition to the pane assigned with pane placement.

Note: This feature requires pane placement to be enabled and impacts the pane assignment behavior.

Considerations when deploying pane placement

There are a few important points to note when planning to deploy pane placement. They are:

- for clustered Meeting Server deployments, consider the number of remote video streams per remote Call Bridge that will be required, see here for more information.
- if you need a fixed pane experience, then ensure you do not assign different participants with the same importance level.

In addition, consider whether you want participants to see different layouts and whether you want participants to be able to change their screen layout.

Using the API to set pane placement

To control the placement of the panes displaying the important participants, use the API to set:

- the **`panePlacementHighestImportance`** parameter. This parameter is set on spaces or calls, and determines how many panes will be reserved for pane placement,
- the **`importance`** value assigned to participant(s) or Access Method for a specific space, or the **`importance`** value assigned to participant(s) of a specific call,
- the screen layout selected for the endpoint.

In the **`allEqualQuarters`** layout shown in Figure 6, if **`panePlacementHighestImportance`** is set to 4, then:

- pane #1 will be reserved for a participant with importance set to 4
- pane #2 will be reserved for a participant with importance set to 3
- pane #3 will be reserved for a participant with importance set to 2
- pane #4 will be reserved for a participant with importance set to 1

Figure 6: Pane positions using allEqualQuarters screen layout

#1	#2
#3	#4

Pane placement will display a blank pane on the endpoints used by other participants if the participant with the assigned importance has not yet joined the conference in the space (either by dialing in or being dialed out to). This has the effect of fixing the displayed position of the important participant on SIP endpoints other than their own. If importance is used without pane placement, then the pane displaying an important participant will move around as other important participants join and leave the conference. The important participant is not displayed in a pane on their own endpoint.

Note: Pane placement on the Meeting Server applies conference wide, and is not configurable per participant.

Note: The way a participant joins a conference does not affect pane placement, for instance there is no effect whether a participant dials in to join a conference or is dialed out to.

Note: Pane placement is not applicable to forwarded Lync calls or those involving the AVMCU.

Note: The pane placement feature is not currently supported by the Recorder or Streamer. If pane placement is selected through the Meeting Server API, then the ability to set importance is disabled in Cisco Meeting Management for meetings where pane placement is in use.

Setting pane placement on spaces and active calls

Pane placement works on conferences occurring within spaces, and on active calls.

Note: Pane placement does not affect forwarded Lync calls.

To set pane placement on a space:

1. Set a value for parameter **`panePlacementHighestImportance`** for the space, this defines the importance level associated with pane 1; panes 2 onwards are then associated with successively descending importance values:
   - for an existing specific space, PUT to **`/coSpaces/<coSpace id>`** the request parameter **`panePlacementHighestImportance`** set to the chosen value,

- to create a new space with pane placement set, POST to **/coSpaces** with the request parameter **panePlacementHighestImportance** set to the chosen value.

2. Assign importance values to the important participants who will connect to the meeting. Setting the importance value for a participant has been available since version 2.2.

To set pane placement on a call:

1. Set a value for parameter **panePlacementHighestImportance** for the call, this defines the highest importance level to be used in the call:
   - for an active call, PUT to **/calls/<calls id>** the request parameter **panePlacementHighestImportance** set to the chosen value,
   - if creating a new call with pane placement set, POST to **/calls** with the request parameter **panePlacementHighestImportance** set to the chosen value.
2. Assign importance values to the important participants that will connect to the meeting, setting the importance value for a participant has been available since version 2.2:
   - create a new participant with the assigned importance for the specified call, POST to **/calls/<call id>/participants** with the request parameter **importance** set to the chosen value, or
   - assign an importance to a specified participant in the conference, PUT to **/participants/<participant id>** with the request parameter **importance** set to the chosen value

Note: Setting the **panePlacementHighestImportance** parameter on a specific call will only apply to that call, and will not persist between calls. This differs to setting the **panePlacementHighestImportance** parameter on a specific space which will persist between calls to that space.

Note: **panePlacementHighestImportance** on **/calls** has the following additional order of precedence:

- use the value set for **panePlacementHighestImportance** on **/calls**
- if **panePlacementHighestImportance** on **/calls** is unset, then use the value set for **panePlacementHighestImportance** on **/coSpace** (if the call is to a space)
- if **panePlacementHighestImportance** is still unset, then pane placement is disabled.

Once pane placement is operational, the following rules are applied:

- Number of participants shown on an endpoint will depend on the layout selected for that endpoint.

- Participants are placed based on their importance value (highest importance is placed first). A blank pane is inserted if no participants match a specific importance level, for instance because the level was not assigned, the participant has yet to join the meeting or has already left the meeting.
- Participants with a higher importance than specified in **`panePlacementHighestImportance`** for the space or active call, appear “at the top of the layout”, no blank panes are added for importance values between this participant’s importance and the **`panePlacementHighestImportance`** value. Similarly, if an Access Method to a space is configured with a higher importance value for **`panePlacementHighestImportance`** than that set for the space, then participants with importance values greater than the **`panePlacementHighestImportance`** set for the space will be displayed first, blank panes will not represent gaps in the importance levels between the value set for the Access Method compared to the space.
- From version 2.7, an administrator setting the parameter **`panePlacementSelfPaneMode`** on a space or active call, can select whether participants with an assigned importance level are able to see their "self" pane in the layout, or a blank pane, or skipped over.
- If a participant with no importance set is reached before the panes on the screen run out, the remaining layout panes will be filled with any participants not yet placed, but are in the active speaker history order (most recent speakers first). Blank panes are not added in between them and participants with assigned importance.
- If multiple participants are given the same importance value, then they are ordered according to who is the most frequent active speaker. In this mode, there is no reordering of participants to keep them in the same pane, so participants will move between panes. If you use the self pane mode then it is advisable to only assign one participant to each importance level.
- If the conference is split across several Meeting Servers, the participants that are shared across the distribution link appear in the panes according to their importance. If the participant is present, but the video stream isn't sent over the distribution link, an empty pane is inserted. As the most important participants are shared over the distribution link, the more important (higher importance value) panes will always be filled for all participants. However, it will depend on which Meeting Server a participant is hosted on as to whether they see a participant or an empty pane. See here for more information.
- If pane placement is activated at a **`/coSpace`** level, it can not be deactivated at a **`/call`** level.

Removing pane placement

To remove pane placement, leave the **`panePlacementHighestImportance`** parameter as unset (leave the parameter value as blank).

Using API to enable active speaker in pane placement

The new **`panePlacementActiveSpeakerMode`** API parameter can be configured to enable active speaker in pane placement. This parameter is supported by the following methods:

- POST to **`/coSpaces`**
- PUT to **`/coSpaces/<coSpace id>`**
- GET on **`/coSpaces/<coSpace id>`**
- POST to **`/calls`**
- PUT to **`/calls/<call id>`**
- GET on **`/calls/<call id>`**

The parameter setting at the calls level takes precedence over the setting at coSpace level. If unset at both levels, active speaker is disabled.

Parameter	Type/Value	Description/ Notes
panePlacementActiveSpeakerMode	allowself | suppressself | none	• allowself - displays the participant in the first pane if they are the active speaker, additional to displaying the participant in the pane set by pane placement. The same view is displayed for all participants. • suppressself - displays the active speaker in the first pane for all other participants other than the active speaker. For the active speaker, the previous speaker is displayed in the first pane. • none - the feature is disabled.

Enabling active speaker in pane placement

Let's take the example of the following pane placement assignment for the participants:

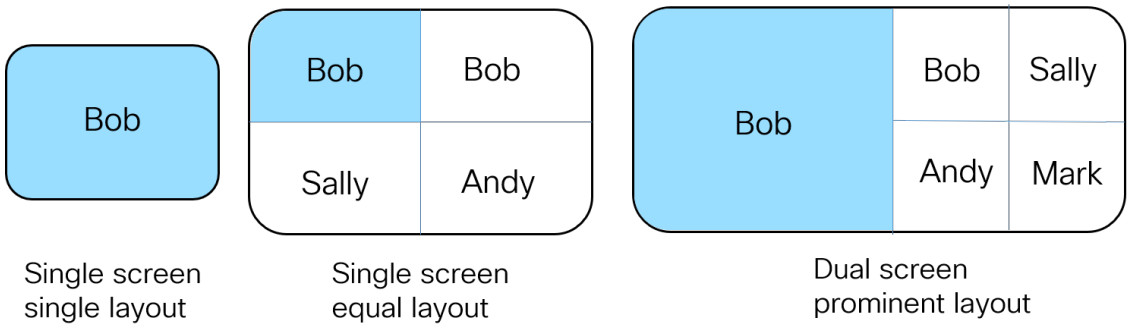
Participant	Pane
Bob	1
Sally	2
Andy	3
Mark	4

Note: In all layouts, the first pane is reserved for the active speaker or the previous speaker depending on the **`panePlacementActiveSpeakerMode`** parameter setting.

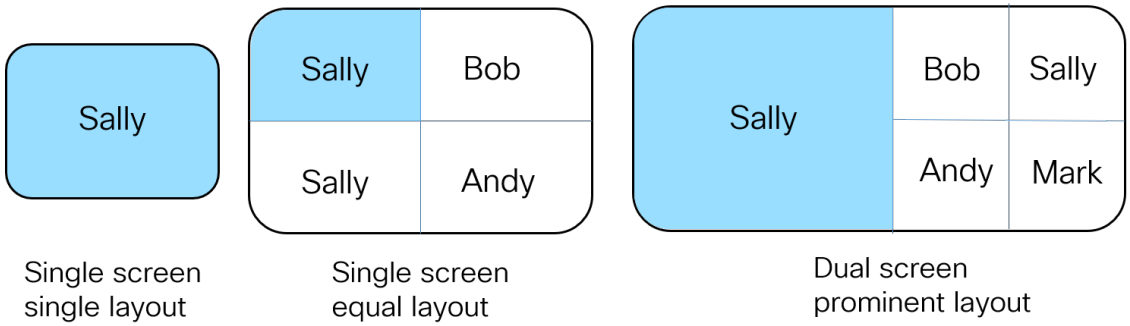
allowself setting

In this setting, the first pane is reserved for the active speaker and the same view is displayed to all the participants including the active speaker.

When **`panePlacementActiveSpeakerMode`** is set to allowself and Bob is the active speaker, this is the view for all the participants:



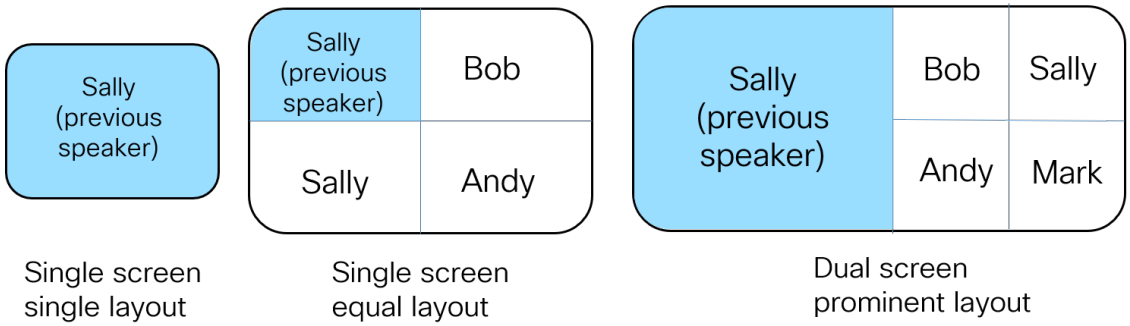
If Sally is the active speaker, this is the view for all participants:



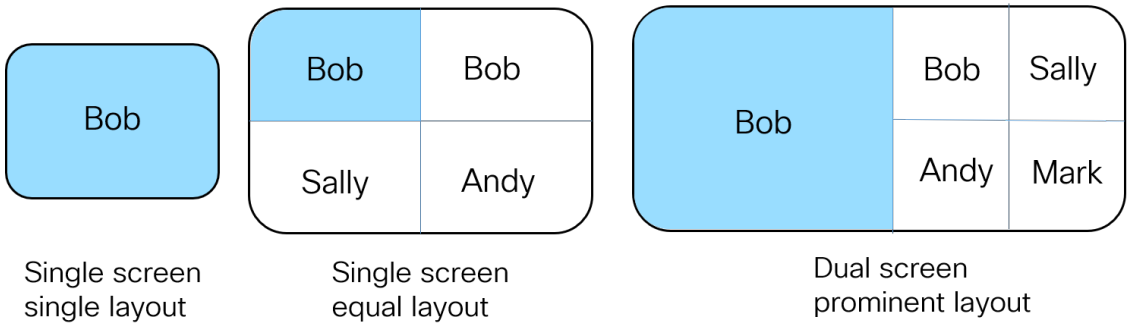
suppressself setting

With this option, the active speaker's view is different from the view of the other participants. In the other participants' view, the active speaker is seen in the first pane. In the active speaker's view, the previous speaker is seen in the first pane.

When the parameter **`panePlacementActiveSpeakerMode`** is set to suppressself and Bob is the speaker, this is Bob's view:



When the parameter **panePlacementActiveSpeakerMode** is set to suppressself and Bob is the speaker, this is the view for all other participants:



When active speaker is enabled for main video and presentation in a single screen video endpoint, active speaker pane is always the first in the row. In this case, the active speaker will only be shown twice if they are placed in one of the first five panes.

Using the API to set the Self pane mode

An administrator setting the parameter **panePlacementSelfPaneMode** on a call or a space can select whether participants with an assigned importance level are able to see their "self" pane in the layout, or a blank pane, or skipped over. Setting the **panePlacementSelfPaneMode** parameter to self or blank and setting the value for **panePlacementHighestImportance** to match the number of panes in the selected screen layout has the effect of fixing the pane placement on all SIP endpoints dialing into the call or the space.

It is recommended that each importance level is only assigned to a single participant if using the self pane mode, assigning an importance level to more than one participant can result in an incorrect self pane being displayed to the participant.

If the **panePlacementHighestImportance** parameter is set to a value smaller than the number of panes in the layout, then the remaining panes not used for important participants will be taken by participants with no importance assigned, these panes will remain dynamically allocated. Similarly, if the number of panes in the selected layout is less than the number of

participants with an assigned importance, then only those assigned the highest importance levels will appear in the panes and only their self panes will be displayed.

Self pane mode is typically used in conjunction with setting the screen layout and preventing a participant from changing their screen layout (through **/dtmfProfiles**).

Use the API to set **panePlacementSelfPaneMode** for:

- an existing specific space. PUT to **/coSpaces/<coSpace id>** the request parameter **panePlacementSelfPaneMode** set to **self**, **skip**, **blank** or leave unset, see below.
- a new space. POST to **/coSpaces** with the request parameter **panePlacementSelfPaneMode** set to the chosen value,
- an active call, that is already in existence. PUT to **/calls/<call id>** the request parameter **panePlacementSelfPaneMode** set to the chosen value,
- a new call that is being created. POST to **/calls** with the request parameter **panePlacementSelfPaneMode** set to the chosen value.

The parameter **panePlacementSelfPaneMode** can take the values:

self - participants with importance set will see themselves in a specific pane in the pane layout.

skip - same as the pre-2.7 version behavior, on a per-viewer basis the screen layout skips the self pane and displays the pane of the next important participant.

blank - leaves a blank pane instead of displaying the important participant, so the important participant still sees the other participants in the same pane position as all other viewers.

if the **panePlacementSelfPaneMode** parameter value is left unset, the self pane mode follows this order of precedence:

- use the value set for **panePlacementSelfPaneMode** on **/calls**,
- if **panePlacementSelfPaneMode** on **/calls** is unset, then use the value set for **panePlacementHighestImportance** on **/coSpace** (if the call is to a space),
- if **panePlacementSelfPaneMode** on **/coSpace** is also unset, then it reverts to the **skip** behavior defined above.

By default, the **panePlacementSelfPaneMode** parameter value is left unset.

Setting self pane mode

To use the self pane mode:

1. Set the importance levels of participants, as appropriate for the call or the space
2. Set a value for the **`panePlacementHighestImportance`** parameter. Note: if **`panePlacementHighestImportance`** is unset, then self pane mode does not take effect.
3. Set **`panePlacementSelfPaneMode`** = **`self`** or **`skip`** or **`blank`** or **`<unset>`** on **`/coSpaces`**, **`/coSpaces/<coSpace id>`**, **`/calls`** or **`/calls/<call id>`** as required.

Note: If participant labels are turned on, then the participant labels will be displayed on the self pane.

Note: If a participant is assigned an importance level greater than the value set for **`panePlacementHighestImportance`**, then they will not see their self pane. Self panes are only included in the end point layout for participants with importance set equal or less than the **`panePlacementHighestImportance`**. However, participants with importance values greater than **`panePlacementHighestImportance`** will still be displayed to other participants.

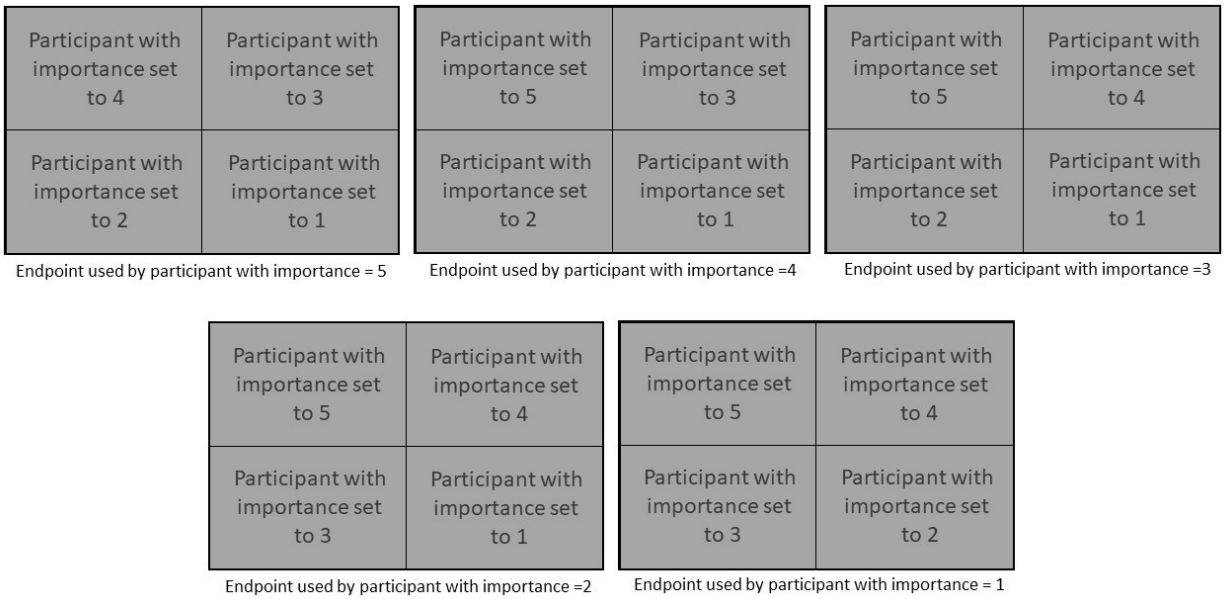
Note: Although a participant using an endpoint without "self-view" can use their self pane to ensure they are correctly framed within the pane, it is not recommended that participants use self pane in this way on endpoints capable of locally rendering self-view. The quality of self pane will not be as good as the locally rendered self-view, as the video stream for self pane is transcoded which adds latency.

Example

Figure 7 and Figure 8 below illustrate the pane layout on SIP endpoints used by 5 participants dialing into the same call. The example assumes:

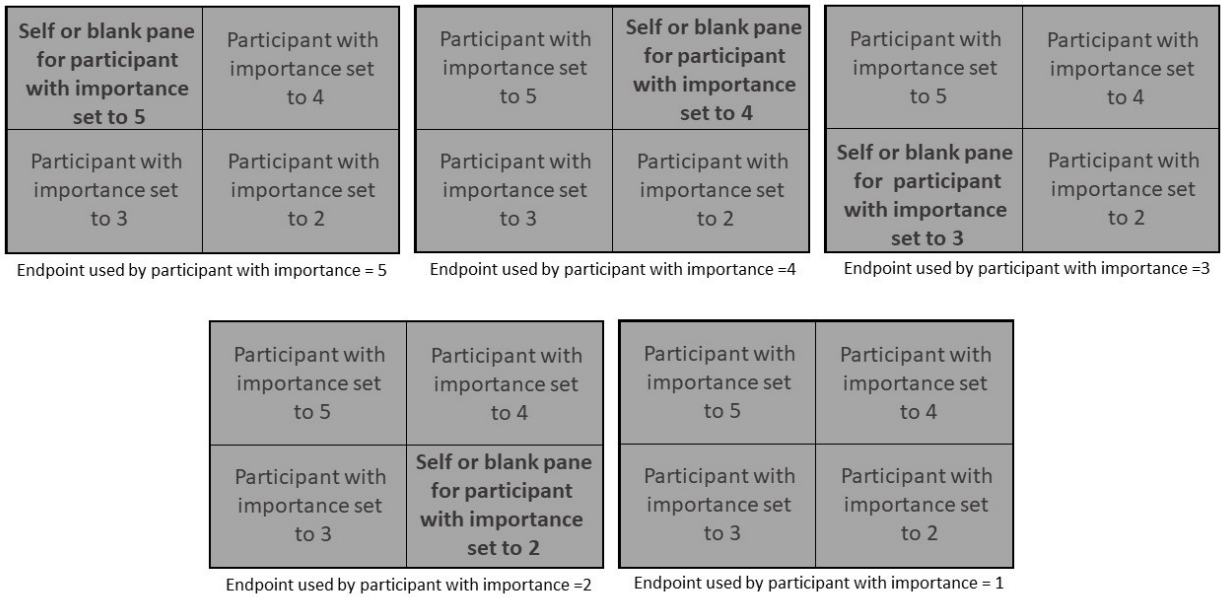
- each endpoint is configured to use **`allEqualQuarters`** screen layout in a fixed 2x2 layout,
- each participant has a unique importance level set from 5 to 1 when they dial into the call,
- the call has **`panePlacementHighestImportance`** = **`5`**
- **`panePlacementSelfPaneMode`** is set either to **`skip`**, **`self`** or **`blank`**

Figure 7: **`panePlacementSelfPaneMode`** set to **`skip`** (default mode)



Setting **`panePlacementSelfPaneMode`**= **`skip`** results in each of the five endpoints displaying a different pane layout.

Figure 8: **`panePlacementSelfPaneMode`** set to **`self`** or **`blank`**



Setting **`panePlacementSelfPaneMode`**= **`self`** or **`blank`** results in a fixed layout across the five endpoints. Participant with importance set to 1 will not be displayed on any of the 5 endpoints, in addition if others join the call without an importance set, then the endpoint they use will show the same pane placement as that for participant with an importance of 1.

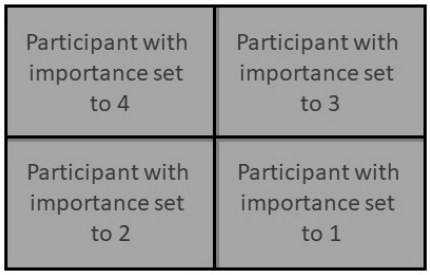
Placing panes on single screen endpoint systems

This section explains the effect of using pane placement to control the view of participants using single screen endpoints.

`panePlacementHighestImportance` matches number of panes in screen layout

Figure 9 shows the view of a participant using an endpoint with the screen layout set to allEqualQuarters. The space or active call that the participant is connected to has `panePlacementHighestImportance` set to 4, and participants with importance of 4, 3, 2, 1 are connected to the meeting, the participant using the screen does not have any importance set. All other participants joining the meeting are unimportant and see the same layout as this participant.

Figure 9: Pane placement on allEqualQuarters screen layout with importance set on participants

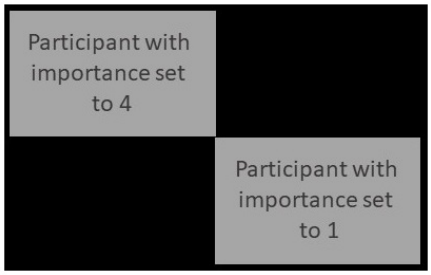


where:

- `panePlacementHighestImportance` for space or active call = 4
- importance not set for specific participant using the screen

If any of the important participants are not connected to the space, or active call, then this participant will see a blank pane in place of the missing important participant, see Figure 10.

Figure 10: Participants with importance levels of 3 and 2 missing from meeting



where:

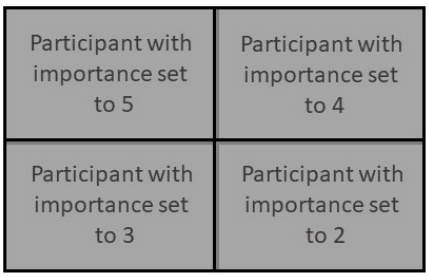
- `panePlacementHighestImportance` for space or active call = 4
- importance not set for specific participant using this screen

- participants with importance levels of 3 and 2 missing from meeting

`panePlacementHighestImportance` greater than number of panes in screen layout

When the space or active call has the `panePlacementHighestImportance` value set larger than the number of panes on an endpoint, the lesser "important" people will not be shown in the layout, see Figure 11. In this example, the participant with importance set to 1 will never be seen by "non-important" participants, even if they are the only other person connected. If `panePlacementSelfPaneMode` is set to "skip" then the "important" participants will see the participant with importance set to 1 due to their self-view not being shown in a pane.However, if `panePlacementSelfPaneMode` is set to "self" or "blank" then they too will not see participant with importance set to 1.

Figure 11: Importance level of space or active call is greater than number of panes in screen layout



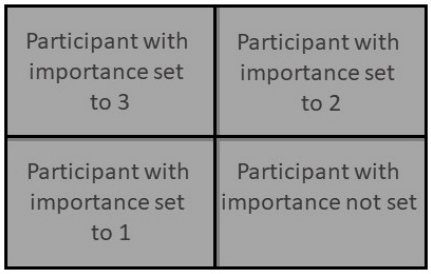
where:

- `panePlacementHighestImportance` for space or active call = 5
- importance not set for specific participant using this screen

`panePlacementHighestImportance` smaller than number of panes in screen layout

If the space or active call is set with a `panePlacementHighestImportance` value smaller than the number of panes in the layout, then a "non-important" participant who has recently been an active speaker will be shown in pane #4, see Figure 12

Figure 12: Importance level of space or active call is less than number of panes in screen layout



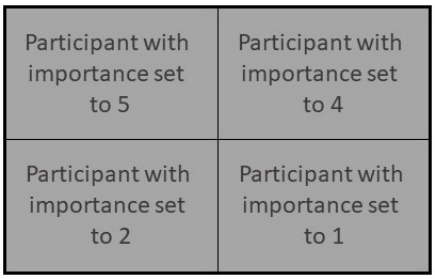
where:

- **`panePlacementHighestImportance`** for space or active call = 3
- importance not set for specific participant using this screen

The effect of self pane mode

Figure 13 shows the view seen by a participant with importance set to 3 using an endpoint with the screen layout set to allEqualQuarters, other participants have importance levels 5,4,2,1. The space or active call that the participant is connected to has highest importance 5, and the self pane mode is set to "skip".

Figure 13: Self view not shown in screen layout for participant with importance = 3



where:

- **`panePlacementHighestImportance`** for space or active call = 5
- importance set for all 5 participants
- **`panePlacementSelfPaneMode`** = skip

Figure 14 shows the view seen by the participant with importance set to 3, and the self pane mode set to "self".

Figure 14: Self view shown in screen layout for participant with importance = 3

Participant with importance set to 5	Participant with importance set to 4
Self view for participant with importance set to 3	Participant with importance set to 2

where:

- **`panePlacementHighestImportance`** for space or active call = 5
- importance set for all 5 participants
- **`panePlacementSelfPaneMode`** = self

Figure 15 shows the view seen by the participant with importance set to 3, and the self pane mode set to "blank".

Figure 15: Blank pane shown in place of participant with importance = 3

Participant with importance set to 5	Participant with importance set to 4
	Participant with importance set to 2

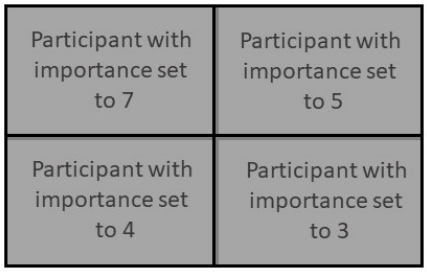
where:

- **`panePlacementHighestImportance`** for space or active call = 5
- importance set for all 5 participants
- **`panePlacementSelfPaneMode`** = blank

Participant has higher importance than **`panePlacementHighestImportance`** set on the space/call

If a participant has a higher importance than that set for the space or active call, the participant will be shown, but there will be no blank panes to reserve an importance above the **`panePlacementHighestImportance`** value. Figure 16 shows the view for a participant without an importance level set, where the **`panePlacementHighestImportance`** value for the meeting is set to 5, but there is a participant with importance set to 7 which fills the first pane. A blank pane is not reserved for a participant with an importance level of 6.

Figure 16: View for participant without importance set

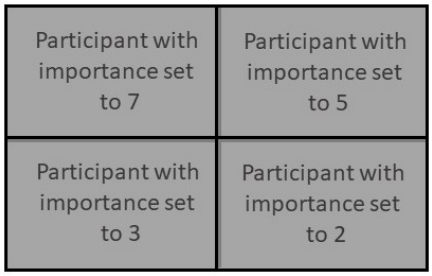


where:

- **`panePlacementHighestImportance`** for space or active call = 5
- importance set for participants with importance levels 7, 5, 4, 3, 2 , 1

Figure 17 shows the view of the same space or active call as Figure 16, for the participant with importance set to 4 and **`panePlacementSelfPaneMode`** = skip.

Figure 17: View for participant with importance set to 4

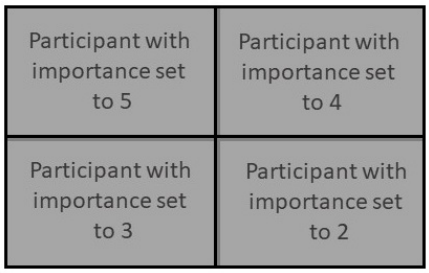


where:

- **`panePlacementHighestImportance`** for space or active call = 5
- importance set for participants with importance levels 7, 5, 4, 3, 2, 1
- **`panePlacementSelfPaneMode`** = skip

Figure 18 shows the view of the same meeting for participant with importance set to 7.

Figure 18: View for participant with importance set to 7



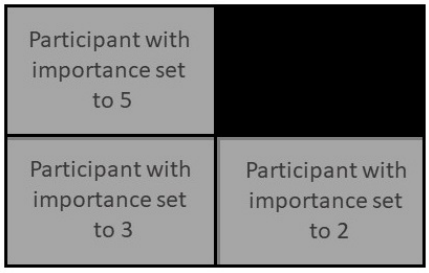
where:

- **panePlacementHighestImportance** for space or active call = 5
- importance set for participants with importance levels 7, 5, 4, 3, 2, 1
- **panePlacementSelfPaneMode** = skip

If the participant with importance 7 leaves the meeting, then the layout changes to participant with importance 5 being in the top left, no blank pane is reserved for importance 7 or 6. For importance 5 and below, the lack of a participant at that level in the meeting will generate a blank pane.

Figure 19 shows the affect of participant with importance set to 4 also leaving the meeting.

Figure 19: View if participant with importance set to 4 also leaves the meeting



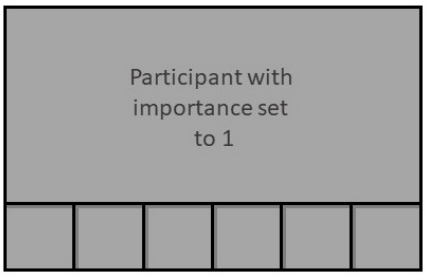
where:

- **panePlacementHighestImportance** for space or active call = 5
- importance set for participants with importance levels 7, 5, 4, 3, 2, 1
- participants with importance 7 and 4 have left the meeting

One speaker to many listeners

For meetings where there will be one important person speaking and many participants listening and may be asking questions, simply set the importance level of the person speaking and leave the importance of all other participants as unset. The important participant will always be shown in a main pane and other participants who have recently spoken will be shown in the smaller panes, see Figure 20.

Figure 20: Main speaker only with importance set



where:

- **`panePlacementHighestImportance`** for space or active call = 1
- importance level only set for main speaker

If the main speaker is joined by a guest speaker and they both have the same importance level, then who ever of the two was the most recent active speaker will be shown in the main pane. This applies for telepresence, stacked, speakerOnly and onePlusN screenlayouts.

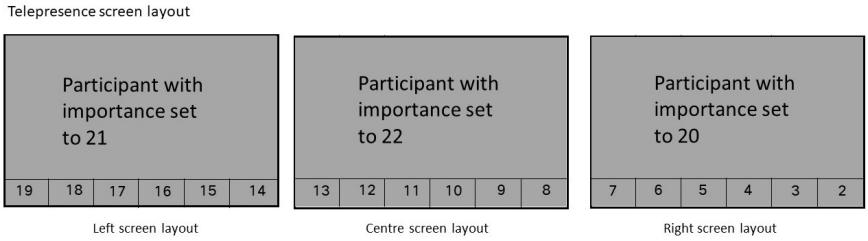
Placing panes on multiple screen endpoint systems

Normally endpoint systems with multiple cameras and screens have special handling when represented in layouts, for example a triple screen endpoint will show all 3 displays, from another triple screen system. However this special treatment is not applied to pane placement scenarios, where only the display showing the active speaker is shown, regardless of the type of viewing endpoint system.

Panes on triple screen endpoint systems are placed in position order, see section Pane sequence.

The following example shows the Telepresence screen layout on a triple screen endpoint, where it is the only triple screen system in the conference. The importance of the space or active call is set to 22, and the importance of the participants using this triple screen system is not set, see Figure 21.

Figure 21: Pane placement on triple screen system with importance not set for participants using the system



where:

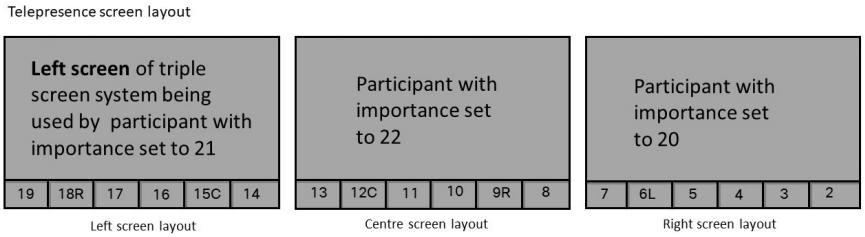
- **`panePlacementHighestImportance`** for space or active call = 22
- importance not set for participants using this triple screen endpoint

Note: the pane sequence starts with the big panes (center-left-right), then left to right for the remaining smaller panes at the bottom of the screens.

Figure 22 shows the views on the triple screen system if other triple screen endpoints join the conference with participant importance set as 21, 18, 15, 12, 9, 6, 1.

Note: Only one pane is shown for participants using the triple screen endpoints, and that pane will show either the left, centre or right (L, C, R) view from the triple screen system depending on where the most recent active speaker was sitting, this pane may not show the participant with the assigned importance level.

Figure 22: View on the triple screen system when other triple screen systems join the conference

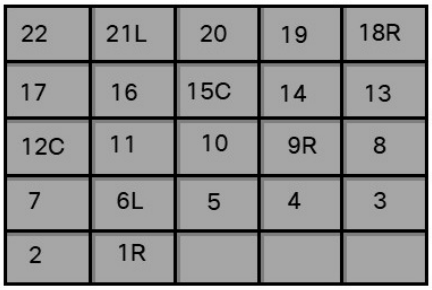


where:

- **`panePlacementHighestImportance`** for space or active call = 22
- importance not set for participants using this triple screen endpoint
- other triple screen endpoints are in the conference, and importance of their participants is set at 21, 18, 15, 12, 9, 6, 1

Figure 23 shows the pane placement of the conference on a single screen endpoint using the allTwentyFifths screen layout. The last 3 panes on the screen will show the most recent active speakers who have no importance set.

Figure 23: Equivalent view on single screen endpoint using allTwentyFifths screen layout

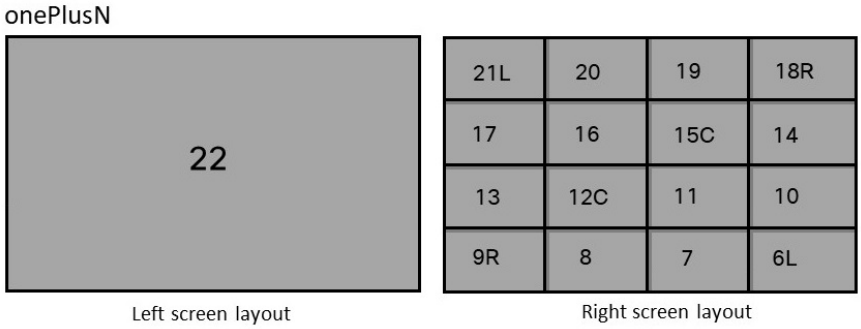


where:

- **`panePlacementHighestImportance`** for space or active call = 22
- only one pane is shown for participants using the triple screen endpoints. Participants using triple screen endpoints in conference have their importance set at 21, 18, 15, 12, 9, 6, 1.

Figure 24 shows the pane placement of the conference on a dual screen screen endpoint using the onePlusN screen layout. Note that the right screen for the triple screen endpoint being used by the participant with an importance of 1 will not be shown on the dual screen endpoint.

Figure 24: Equivalent view on dual screen endpoint using onePlusN screen layout



where:

- **`panePlacementHighestImportance`** for space or active call = 22
- only one pane is shown for participants using the triple screen endpoints. Participants using triple screen endpoints in conference have their importance set at 21, 18, 15, 12, 9, 6, 1.

Example of using Pane Placement

In this example, the **`panePlacementHighestImportance`** has been set to 8 for the space, this implies that there are participants with importance of 8,7,6,5,4,3,2,1; 8 being the most important and 1 the least important of those assigned an importance level. Self pane mode has been set to "skip"; important participants are not shown their self pane in their screen layout, instead the layout skips the self pane and displays the pane of the next important participant.

Participants have been assigned the following importance levels:

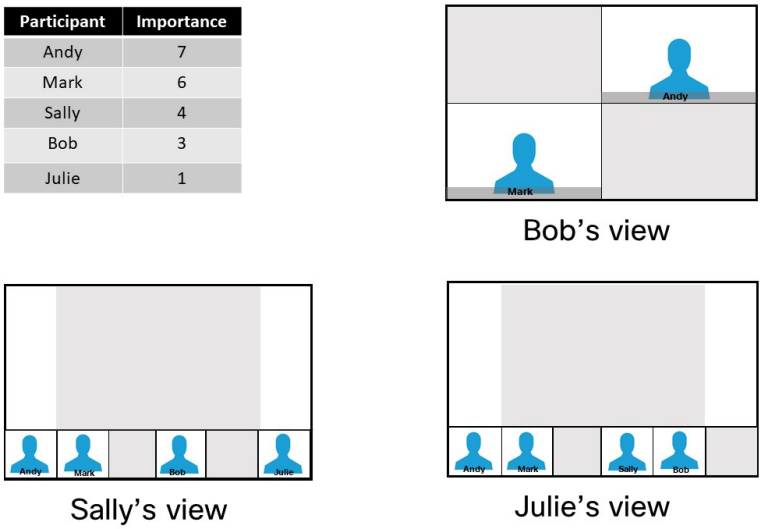
Table 1: Assigned importance levels to participants

Participant	Importance
Kimberley	8
Andy	7
Mark	6
Sally	4
Bob	3
Julie	1

There are no participants configured with importance 5 or 2.

Bob's endpoint is configured for a 2x2 layout, and Sally and Julie's endpoints are configured for stacked layout. Before Kimberley joins the meeting, there is nobody in the meeting with importance 8. Bob's endpoint shows blank panes for importance 8 and 5, Sally and Julie's endpoints show blank panes for importance 8,5 and 2. Since Sally doesn't appear on her own endpoint, Bob appears in different panes in Sally's view compared to Julie's view, see Figure 25.

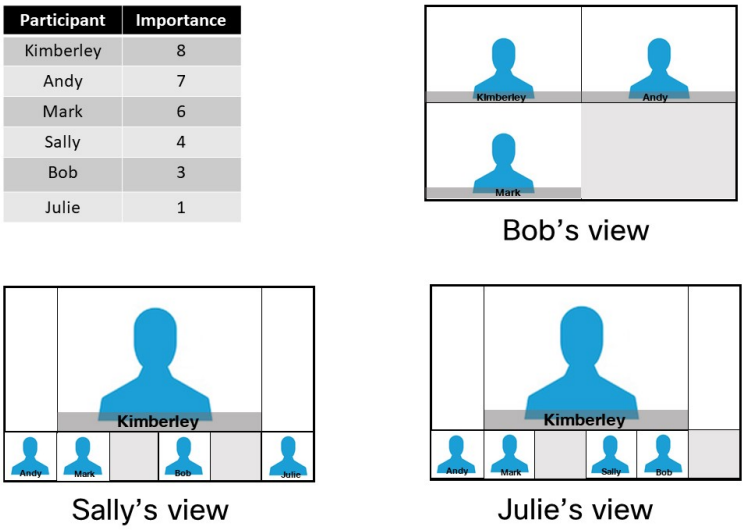
Figure 25: Pane placement at start of meeting with self pane mode set to "self"



Participant	Importance
Andy	7
Mark	6
Sally	4
Bob	3
Julie	1

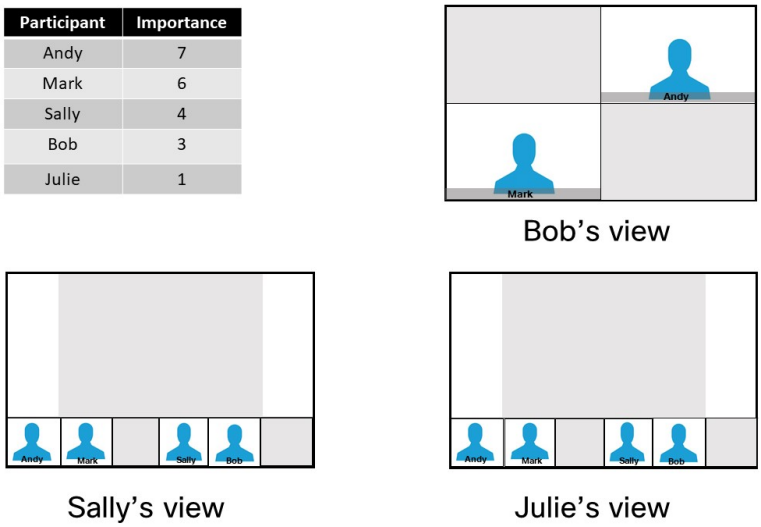
When Kimberley joins the meeting, Bob's endpoint only shows one blank pane for importance 5, Sally and Julie's endpoints show blank panes for importance 5 and 2. Again Bob appears in different panes in Sally's view compared to Julie's view due to Sally not appearing on her own endpoint, see Figure 26.

Figure 26: Pane placement when Kimberley joins the meeting



If **`panePlacementSelfPaneMode`** had been set to "self" for the space instead of "skip", Sally's endpoint which is configured for stacked layout will show her self pane, but Bob's endpoint which is configured for a 2x2 layout will not show his self pane as there are insufficient panes in the layout on his endpoint. Julie's endpoint which is also configured for stacked layout will show the same layout as Sally's endpoint it will not show her self pane as their are insufficient panes in the layout of her screen. See Figure 27.

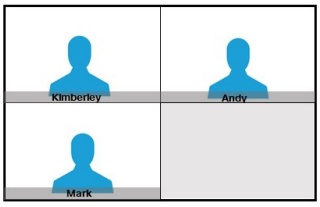
Figure 27: Pane placement at start of meeting with self pane mode set to "self"



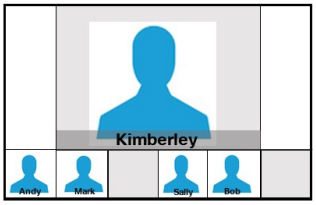
When Kimberley joins the meeting, the layout of the panes remains unaltered and Kimberley is displayed in pane #1, see Figure 28.

Figure 28: Pane placement when Kimberley joins the meeting with self pane mode set to "self"

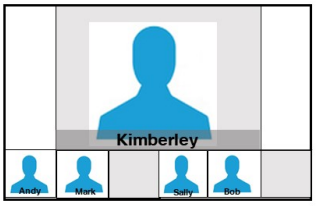
Participant	Importance
Kimberley	8
Andy	7
Mark	6
Sally	4
Bob	3
Julie	1



Bob's view



Sally's view



Julie's view

More video streams over distribution links between clustered Call Bridges (preview feature)

Note: This remains a beta feature.

Prior to version 2.3, video from a maximum of four remote participants could be sent over each distribution link between clustered Call Bridges. From version 2.3, the Meeting Server supports up to nine video streams over the distribution links. Participants using single, dual and three screen endpoint systems can now have a more consistent conference experience whether conferences are hosted on clustered Call Bridges or on a single Call Bridge.

To configure the maximum number of video streams sent over each distribution link between clustered Call Bridges, set the **`maxPeerVideoStreams`** parameter on API object **`/system/configuration/cluster`** to a value of 1, 4 or 9; the parameter defaults to 4 if not set.

Note: The API parameter **`maxPeerVideoStreams`** parameter can take any value between 1 and 9. However, the screen resolution sent is optimized for 1, 4 or 9, so if you set the variable to 2, 3, 5, 6, 7 or 8 then not all of the screen will be used. For example, if set to "5" then each of the 5 participants will be 1/9th of the screen, similarly if set to "2" then the two participants will be 1/4 of the screen.

To support more than four video streams across a distribution link, it is recommended that the bandwidth of the link be set to greater than 2Mbps. Use the API or the Web Admin Interface to set the bandwidth. If using the API, PUT a value for the **`peerLinkBitRate`** parameter to the API object **`/system/configuration/cluster`**; the value will be the maximum media bit rate to use on distribution links between Call Bridges in the cluster. Alternatively, using the Web Admin Interface, go to **Configuration > Cluster > Call Bridge identity** and enter the **Peer link bit rate**.

Panoramic video layouts (Beta support)

From 2.9, the Meeting Server introduces support for the panoramic layout experience in two participant meetings. This feature supports the new panorama endpoints:

- Cisco Webex Room Panorama
- Cisco Webex Room 70 Panorama
- Cisco Webex Room 70D Panorama Upgrade

When both participants in the meeting are panorama endpoints the Meeting Server can request two camera streams from them so both participants get a wide panoramic view of the other room.

When other video participants join, Meeting Server will only request one camera stream from the panorama endpoint and it will transition from the panoramic layout to the existing dual screen layouts. If you have two panorama endpoints and an audio-only participant joins the meeting, the panoramic experience still applies.

Panoramic layout is fully supported across a Meeting Server cluster. Panoramic layout supports existing CE in-meeting controls (e.g. roster lists, mute, remove). Other features, such as changing the local layout or pane placement are only supported if the panorama endpoint transitions to the existing dual screen layouts, i.e. when there are more than two video participants.

Dual screen endpoints can receive a panoramic layout when in a meeting with a panoramic endpoint.

To support panoramic video, new response values are introduced to existing response elements as follows:

- GET on **`/callLegs/<callLeg ID>`** — the response element **`status`** has the element **`multistreamVideo`** which can return the following two new values:
  - **`numCameras`** which returns the number of multistream main video camera streams currently active for this call leg.
  - **`numCamerasAvailable`** which returns the number of multistream main video camera streams advertised by the far end as being available for this call leg.

Web interface change

From 2.9, the web interface "dual video" indication is changed to "dual screen" for clarity following the introduction of dual camera support.

Customizable Layouts

Meeting Server supports customizable layouts. This allows Administrators more flexibility to create and apply custom layouts that suit their specific needs. This feature can work on single and dual screen endpoints and web app.

Note: Customizable layouts are not supported on triple screen endpoints.

Note: Customizable layouts is a licensed feature. You need to purchase the necessary license to use this feature – it's an option under A-CMS (Cisco Meeting Server subscriptions) and is a subscription that can be used alongside existing perpetual or subscription licenses.
We allow configuration of custom layouts with or without the license key, however without the key Meeting Server will behave as though no custom layout is configured.

Note: Customizable layouts do not apply to Microsoft clients joining a dual homed conference. Customizable layouts will apply if the Microsoft client joins Meeting Server directly.

Example layouts are available to demonstrate the capabilities of customizable layouts and how to create your own. For more information, see "JSON text file customizable layout example" on page 47.

The following information applies to customizable layouts:

- Administrators can apply customizable layouts on a call leg profile basis.
- Customized layouts define what users see, for example, how many participants are displayed, where the participants are displayed, and how big each participant's pane is.
- Existing conference layout restrictions still apply, such as a maximum of 25 participants are displayed on a single endpoint; and a default of 4 remote video streams per remote Call Bridge in a clustered deployment (9 remote video streams across distribution links between clustered Call Bridges is still a preview feature).
- Existing icons / audio prompts will work with customizable layouts.

To support this new feature the following new API objects are introduced in version 2.8:

- **`/layoutTemplates`**
- **`/layoutTemplates/<layout template id>`**
- **`/layoutTemplates/<layout template id>/template`**

Licensing for using customizable layouts

A new API parameter **`customizations`** on **`/system/licensing`** is introduced in version 2.8 to support customizable layouts. The value is available upon issuing a GET command.

How to implement customizable layouts

1. Create your own customized layout template file (JSON text file) using a text editor – you can use a custom layout example supplied by Cisco here. (More information about JSON text file layouts can be found in "JSON text file customizable layout example" on page 47.)
2. Create and give a name to a layout template node with a string parameter **name** using the API:
   - POST to **/layoutTemplates**
3. Assign a JSON layout description to this new layout template node:
   - PUT to **/layoutTemplates/<layout template id>/template** with MIME type set to **application/json**
4. Apply a **layoutTemplate** to a callLegProfile and have that used for call legs to which this profile applies.
   - PUT to **/callLegProfiles/<call leg profile id>** or POST to **/callLegProfiles**

   The customized layout template takes the place of the automatic layout in the set of layouts available to the endpoint.

   For example, if you set **defaultLayout** to **automatic** in a **callLegProfile** that also configures a **layoutTemplate** GUID, all active call legs using that **callLegProfile** will switch to display the custom layout. ActiveControl endpoints can change to or from the customized layout by selecting or deselecting **automatic** as appropriate.

   Note: Set the layout to **automatic** to get the newly-uploaded custom layout to be used in a live conference.

Note: From version 2.9 you can use the API access via the web interface to implement customized layout templates. For more information, see API access on the web interface.

API failure reasons

The new **layoutTemplates** API object can produce the following new API failure reasons:

- **layoutTemplateDoesNotExist** – if the layout template GUID is not recognized.
- **layoutTemplateDescriptionTooLong** – if the proposed layout template description is too long.

Setting / overriding a layout template on a call leg

Each call leg profile parameter can be overridden by specifying a value for the parameter directly on a call leg API object. The new parameter **`layoutTemplate`** is added to callLeg objects. This new parameter supports the following operations:

- POST to **`/calls/<call id>/callLegs`** or PUT to **`/callLegs/<call leg id>`**
- GET on **`/callLegs/<call leg id>`**

Overriding a layout template on a participant

So that API operations on a participant's call legs can be issued from a Call Bridge different to the one where the call legs are homed, the new parameter **`layoutTemplate`** is introduced on participant objects.

To allow overriding of the effective call leg profile settings in the participant's call legs:

- POST to **`/calls/<call id>/participants`**

Support for GET on the 'participants' API node is as follows:

- GET on **`/participants/<participant id>`** can give the response parameters **`layoutTemplate`** and **`defaultLayout`**. Both response parameters reflect the values from the effective call leg profile for both local and remote participants and are nested under **`configuration`** in the response entry.

Getting information for the layout template on an active call leg

You can retrieve information about an active call leg for local participants by using GET on **`/callLegs/<call leg id>`**. The response has nested subsections **`configuration`** and **`status`**, each of which contains the new parameter:

- **`layoutTemplate [ <layout template id> | "" ]`**

The value of **`layoutTemplate`** in the **`configuration`** subsection reflects the value in the resultant call leg profile, whereas the one in the **`status`** subsection specifies which template is actually used. For example, if there is no valid license, the value under **`status`** would be absent despite potentially being present under **`configuration`**.

Turning off a customized layout template

On the objects where **`layoutTemplate`** has a template ID set, change the setting to **`""`**. If the customized layout template is turned off, the layout will switch back to its default behavior.

JSON text file customizable layout example

The definition for a customizable layout is contained within a JSON text file – the JSON file is uploaded and applied to a call leg profile as described in the previous section.

The JSON text file can contain customized layout definitions that describe anything from a single layout to an entire portfolio of multiple layouts.

Each individual customized layout in the portfolio is associated with a set of conditions that trigger the template to display. The set of conditions covers the number of video streams to show in the meeting, and the number of screens that the viewing endpoint is using. Every time one of these changes, for example, a participant joins or leaves the call or the number of screens changes, the portfolio gets re-evaluated and the (first) layout that satisfies all conditions will display. However, if no match is found then the layout reverts to the default "automatic" layout behavior.

Each layout definition within the JSON file has an array called "templates"; which in turn contains an array of objects. Each object represents a layout and the layout object contains two further objects:

- "conditions" section – defines the circumstances in which a layout will display.
  - "numScreens" – defines the number of screens across which the customized layout will display.
  - "minParticipants" and "maxParticipants" (optional) – determines when the layout applies, i.e. the range between "minParticipants" and "maxParticipants" is how many participants to show using this layout template.

    Note: "minParticipants" refers to the number of participant video streams that can be shown in your view (not the number of participants in the conference). The number discounts anyone not visible (e.g. audio only) and will only include yourself if you're using pane placement with self-view mode.

- "panes" array – contains the description for the position of every pane in the layout. The order the panes appear in the JSON text file corresponds to the sequence the panes will display in the layout. If there are fewer participant video streams than there are panes, then the first panes are used.

  The units are 0...1 where 1 is the full width or height of one screen. The code example below shows the positioning of the centered large pane where the mandatory values "left", "right", "upper", "lower" describes the position of the pane edges:

```
        "panes": [
{
  "left": 0.20,
  "right": 0.80,
```

```
        "upper": 0.25,
        "lower": 0.75
      }
    ]
```

The "panes" array can also contain optional values per-pane for:

- "group" — supports 2 groups, 0 and 1. The group value determines the prominence of that particular pane — **`"group": 0`** panes should be first. You then need to determine where you wish to place the first **`"group": 1`** pane.
- "layer" — **`"layer": 0`** places the pane as the bottom layer (can be considered as a "z" coordinate). Values of 1 or above place the pane "on top". (0 is assumed the default if you don't specify a value.)

Figure 29 example template has up to 14 smaller panes surrounding one large centered pane for a single screen, and Figure 30 up to 20 smaller panes surrounding two large panes for a two screen system (active speaker will display in the large panes).

Figure 29: Single screen example custom layout

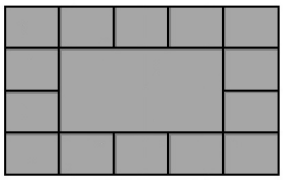
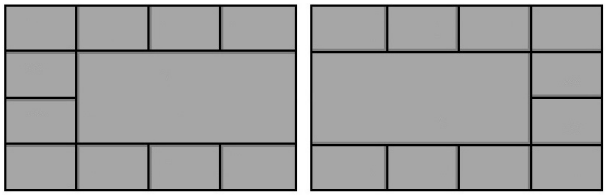


Figure 30: Dual screen example custom layout



Using these examples, the sequence that the panes are displayed as participants join the meeting is shown in the figures below:

Figure 31: Single screen example custom layout pane numbering sequence

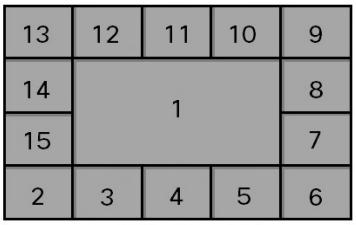
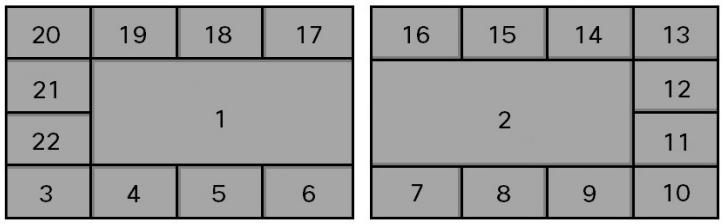


Figure 32: Dual screen example custom layout pane numbering sequence



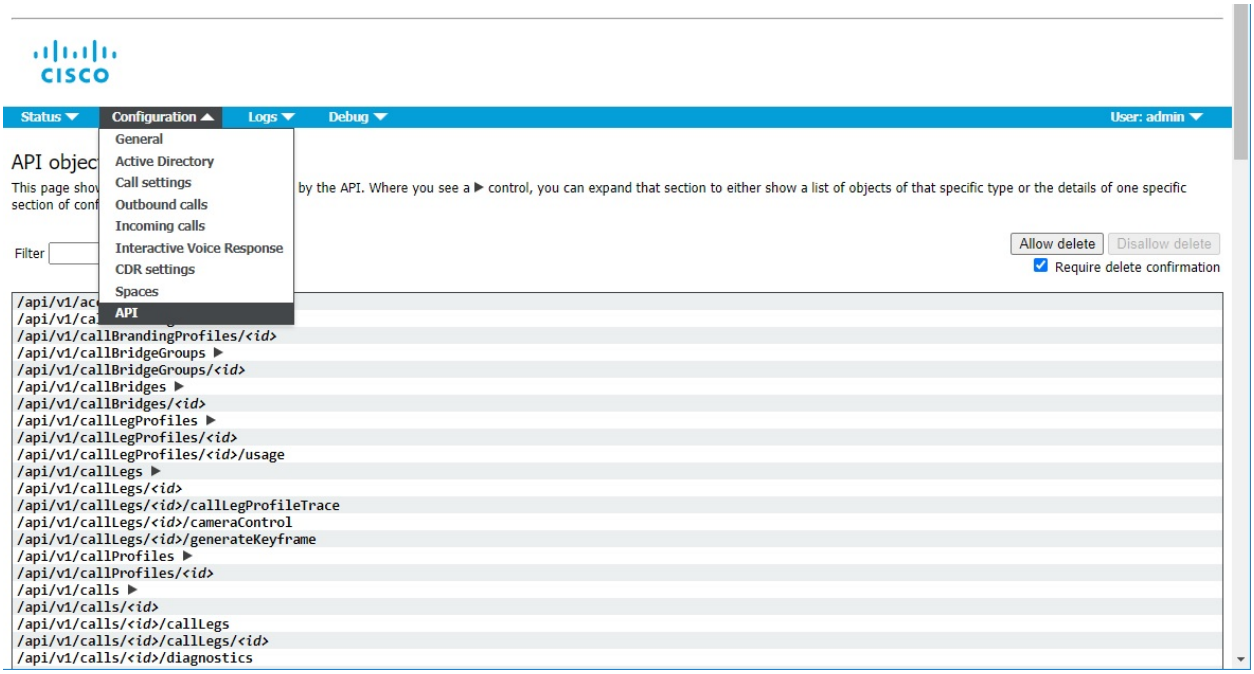
You can create your own layout, or use Cisco-supplied JSON template files to customize further to meet your needs. Example JSON template files can be found at https://github.com/ciscocms/layout-templates

API access on the web interface

To simplify using the Call Bridge API without the need for third-party applications, version 2.9 introduced a user interface for the Call Bridge API that can be accessed via the **Configuration** tab of the Meeting Server web interface, as shown in Figure 33.

The Scheduler APIs introduced in version 3.3 are not supported via this interface. See Accessing Scheduler APIs.

Figure 33: Accessing the Call Bridge API via the Meeting Server web interface



Note: If you wish to delete any configured API objects, select **Allow delete** on the right-hand side of the screen. By default, deletion is disallowed and **Require delete confirmation** is checked to help prevent unintentional deletions.

Features such as customizable layouts offer graphical layout examples making the feature easier to configure rather than using the conventional method of a third-party application to access the API (see Figure 34). Troubleshooting is improved as it summarizes the layout template issues and shows graphical layouts to illustrate where the issues are (see Figure 35).

Figure 34: Customizable layout template example – API access on the web interface

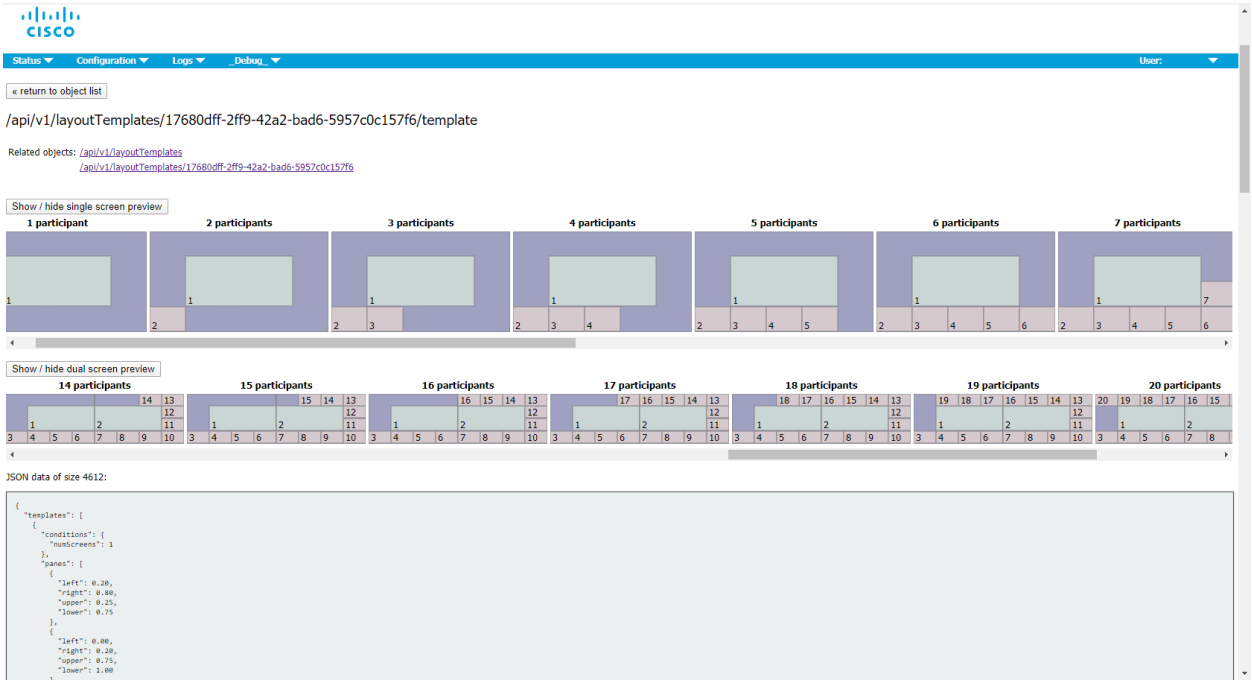
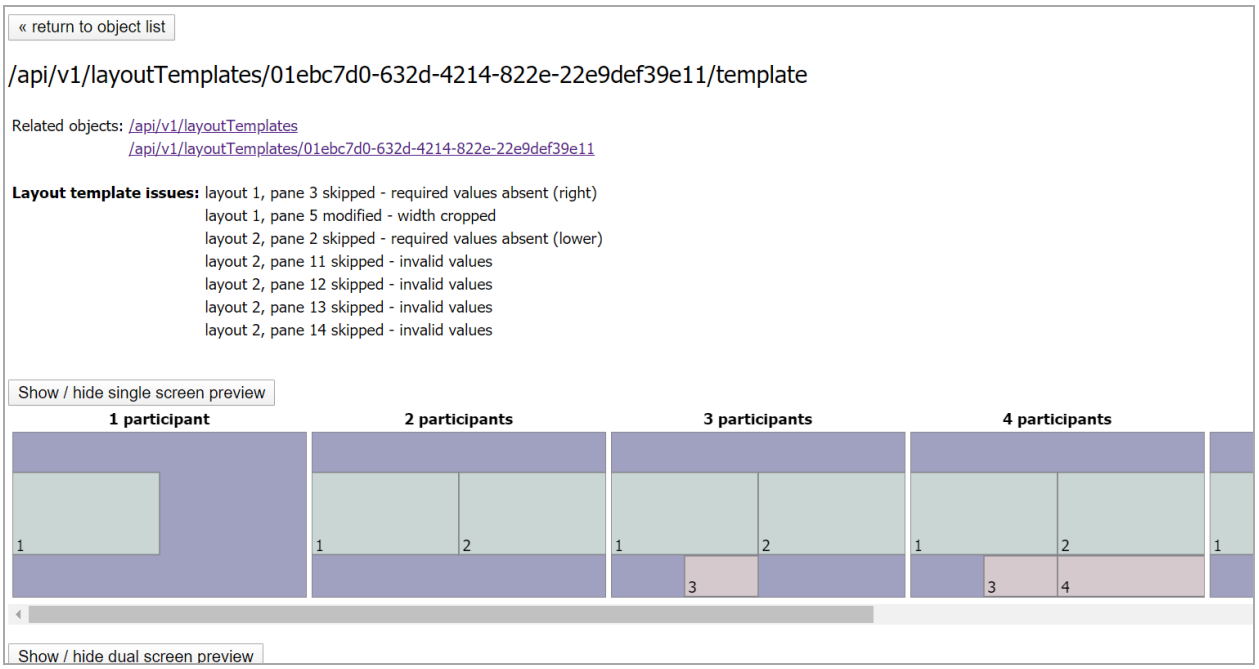


Figure 35: Customizable layout template troubleshooting example – API access on the web interface



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