Multi-Content Solution Deployment Guide

March 2023

Document revision history

Revision	Date	Description
1.3	March 2023	- Updated with RoomOS 11 graphics - Updated and simplified macro with new RoomOS 11 capabilities. The previous versions will still work, this is implementing updated code syntax and an an improvement in how we handle unconnected sources. - Added Appendix on how to to quickly set up with xConfiguration
1.2	February 2022	- Added support for Webex Meetings
1.1	September 2021	- Updated link to 3rd party HDMI -> SDI converter - Fixed cosmetic bug in macro - Changed color of the UI extension panel - Updated panelID to avoid collision with other panels
1.0	November 2020	Initial release

This deployment guide is meant to help install and configure a room for the Multi-Content Solution, enabling the possibility to share multiple local content sources into a single presentation.

Infrastructure Requirements

The Codec Pro must be registered to a 4k capable infrastructure, including a 4k capable multiparty conference solution. This could be CUCM or Expressway for call control, and CMS version 2.9 or later for the multiparty conference solution.

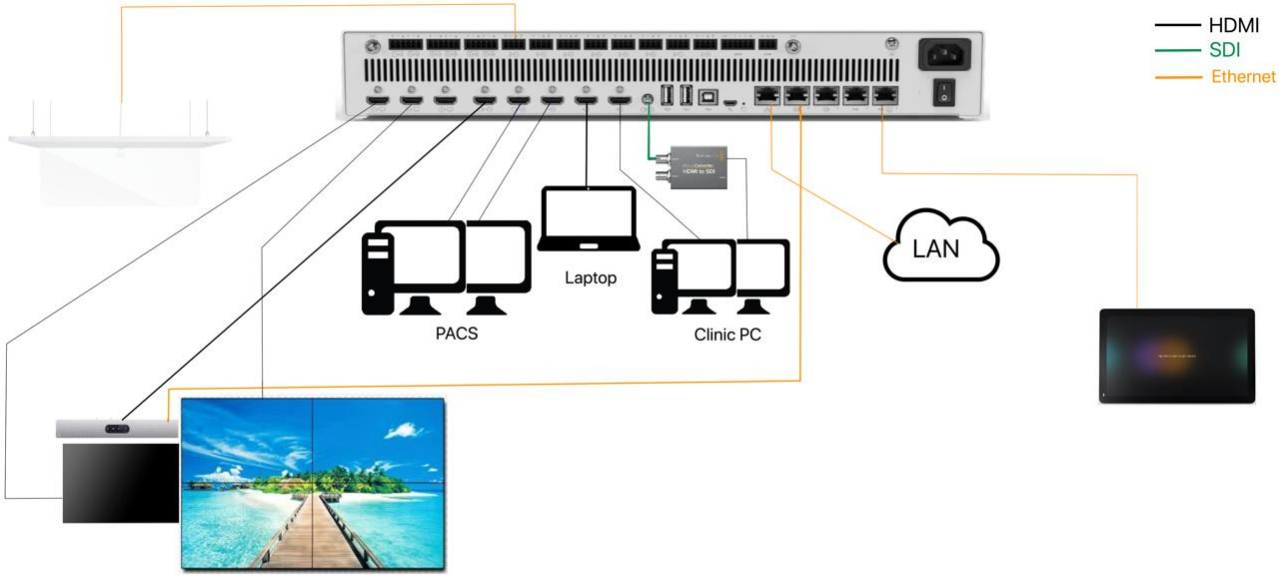
Physical Connections

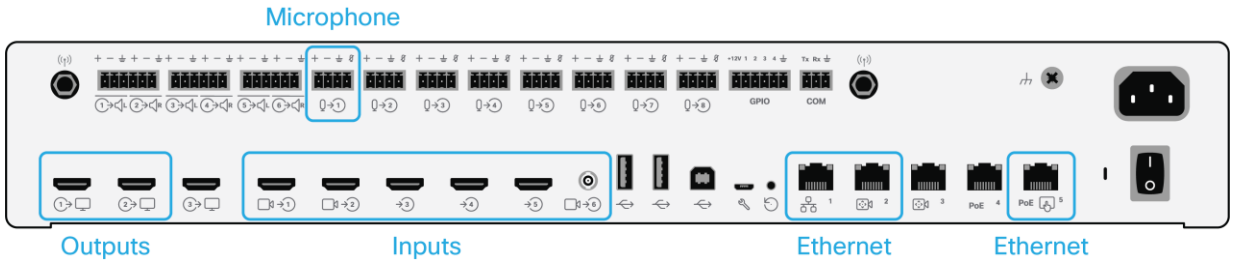
The set-up has the following components:

- Cisco Webex Codec Pro
- Cisco Webex Quad Camera
- Cisco Ceiling Microphone
- Cisco Webex Room Navigator
- HDMI-to-SDI converter
- PACS Machine with 2 monitors
- Clinic PCs with 2 monitors
- Laptop
- Video screen
- Video wall

You are free to use other sources and configurations, but this is what we have used in this guide.

The following illustrations and table explain how to connect the components.





Outputs	Inputs	Ethernet and microphone	Microphone (Euroblock)
HDMI 1: Video screen	HDMI 1: Quad Camera	Ethernet 1: LAN	Ceiling Microphone
HDMI 2: Video wall	HDMI 2: PACS 1	Ethernet 2: Quad Camera	
	HDMI 3: PACS 2	Ethernet 5: Room Navigator	
	HDMI 4: Laptop		
	HDMI 5: Clinic PC 1		
	3G-SDI 6: Clinic PC 2		

HDMI-to-SDI converter

In this setup, we have chosen to use and test an HDMI-to-SDI converter from BlackMagic. You can find the converter from this link:

- https://www.blackmagicdesign.com/products/microconverters/techspecs/W-CONU-11

Note: You can use another HDMI-to-SDI converter if you prefer. We have also tested Decimator MD-HX with success.

You can power the converter with a USB cable that you connect to the Codec Pro if it has a power consumption of less than 500 mA.

3G-SDI

When connecting the two outputs from the Clinic PC to the codec, configure the Clinic PC to send audio to the HDMI cable going straight to the codec, as the 3G-SDI input does not support embedded audio.

> **Note:** The 3G-SDI input only supports 3G-SDI *Level A*, and the converter by default outputs *Level B*. Connect the converter to a computer and run the configuration tool provided by Black Magic to reconfigure it to output *Level A*.

More outputs from the PACS machine

Some customers install an extra Video Graphics Adapter in the PACS machine to enable more outputs, instead of using splitters.

> **Note:** For local sources, such as local PACS machines, the resolution should be set to 1920x1080 to avoid problems with vertical or horizontal black bars.

Configuration

All configurations in this guide are available as a list of xConfiguration commands in Appendix 3.

Video inputs

Configure the input connectors

Sign in to the web interface of the Codec Pro, navigate to *Setup > Configuration > Video > Input*, and set the following settings.

	Connector 1 (Quad Camera)	Connector 2 (PACS 1) Connector 3 (PACS 2) Connector 5 (Clinic PC 1) Connector 6 (Clinic PC 2)	Connector 4 (Laptop)
InputSourceType	Keep the default setting	PC	PC
PresentationSelection	Keep the default setting	Manual	Manual
Visibility	Keep the default setting	Never	Never
Quality	Keep the default setting	Auto	Auto
PreferredResolution	Keep the default setting	1920_1080_60	3840_2160_30

Set the resolution of the monitor (optional)

Depending on your monitor you may need to set the output to the desired resolution. If so, navigate to *Setup > Configuration > Video > Output*, choose the correct **output** connector, and set its resolution.

Example: *Video > Output > Connector 2 > Resolution: 3840_2160_30*

To add the macro and the UI extension, you can automatically add them via https://roomos.cisco.com/macros/Multi-Content%20Solution, or you can add them manually by following these steps.

Add the UI extension

1. Navigate to *Integration > UI Extensions Editor*. Open the menu in the upper right corner of the editor, and choose "Merge from file".

   Select the file, "MCS_panel.xml", from your PC, to upload it to the Codec Pro with "Merge from file"

   You can find a copy of the MCS_panel.xml file in Appendix 1.

   Note: "Merge from file" will add a file to your existing setup, whereas "Import from file" will overwrite your current setup!

2. Open the menu in the upper right corner of the editor again, and choose "Export to video system".

   When this is done, you get a preview of the panel that will be shown on the Touch 10 / Room Navigator.

Add the macro

1. Go back to the web interface and navigate to *Integration > Macro Editor*.

   Note: If prompted a question whether you want to enable macros, select “Yes”.

2. Click “Import from file” in the upper left corner of the macro editor, and select the file “MCS_v11.js”. This will not overwrite your setup like in the UI Extension Editor

   You can find a copy of the MCS_v11.js file in Appendix 2.

3. Save the macro by clicking on the floppy disk icon next to the macro name, and enable it with the toggle switch.

Audio inputs

Configure audio on the input connectors

Go back to the web interface and navigate to *Setup > Configuration > Audio > Input*, and set the following settings.

	HDMI 2	HDMI 3	HDMI 4	HDMI 5
VideoAssociation MuteOnInactiveVideo	Off	Off	On	Off

Audio is not supported on Connector 6, as this is an SDI input.

Check that the codec is sending video with 4k resolution

You should verify that the codec is sending video with 4k resolution.

Navigate to *Setup > Status > Video > Output > Connector 2*

You can click the minus icon to colaps groups of statuses, so that it easier to find “Output” and “Connector 2”.

Check that the resolution is 3840x2160 (4k):

- Resolution > Height: 2160
- Resolution > Width: 3840

If not, check which formats the monitor supports under “ConnectedDevice > SupportedFormat”. Navigate to *Setup > Configuration > Video > Output > Connector 2*, and change the Resolution from “Auto” to one of the supported formats (e.g. 3840_2160_30).

You can click the minus icon to colaps groups of statuses, so that it easier to find “Output” and “Connector 2”.

Note: If you are using a video wall, ensure that 4k passthrough is possible even though panels only support 1080p each.

Cleaning up the user interface

To give the system a cleaner look, you may choose to remove the buttons that you are not going to use. With RoomOS 11, we have more screen real estate, so we can allow a few more of the buttons to be visible than we could with RoomOS 10.

Navigate to *Setup > Configuration > UserInterface > Features > Call* , and change the following settings to suit your needs:

Setting	Reccommended
CameraControls	Auto
End	Auto
HdmiPassthrough	Auto
JoinGoogleMeet	Hidden
JoinMicrosoftTeams	Hidden
JoinWebex	Auto
JoinZoom	Hidden
Keypad	Auto
LayoutControls	Auto
MidCallControls	Auto
MusicMode	Hidden
ParticipantList	Auto
SelfviewControls	Auto
Start	Auto
VideoMute	Hidden

These are not required, but will help clean up the look and feel of the system.
Navigate to *Setup > Configuration > UserInterface* , and change the following settings to suit your needs:

Setting	Reccommended
Help - > Tips	Hidden
KeyTones Mode	Off
SoundEffects Mode	Off

Appendix 1: The UI Extension panel

The latest version of this file is available on Github at https://github.com/CiscoDevNet/roomdevices-macros-samples/tree/master/Multi-Content%20Solution

```
<Extensions>
  <Panel>
    <Order>1</Order>
    <PanelId>mcs_panel</PanelId>
    <Origin>local</Origin>
    <Type>Statusbar</Type>
    <Icon>Laptop</Icon>
    <Color>#262626</Color>
    <Name>Share screen</Name>
    <ActivityType>Custom</ActivityType>
    <Page>
      <Name>Select content to share</Name>
      <Row>
        <Name> </Name>
        <Widget>
          <WidgetId>presentation_source</WidgetId>
          <Type>GroupButton</Type>
          <Options>size=4;columns=2</Options>
          <ValueSpace>
            <Value>
              <Key>pacs_1</Key>
              <Name>PACS monitor 1</Name>
            </Value>
            <Value>
              <Key>pacs_2</Key>
              <Name>PACS monitor 2</Name>
            </Value>
            <Value>
              <Key>pc_1</Key>
              <Name>Clinic PC monitor 1</Name>
            </Value>
            <Value>
              <Key>pc_2</Key>
              <Name>Clinic PC monitor 2</Name>
            </Value>
          </ValueSpace>
        </Widget>
        <Widget>
          <WidgetId>presentation_source2</WidgetId>
          <Type>GroupButton</Type>
          <Options>size=4;columns=1</Options>
          <ValueSpace>
            <Value>
              <Key>4_sources</Key>
              <Name>PACS + Clinic PC (4-split)</Name>
            </Value>
            <Value>
              <Key>laptop</Key>
              <Name>Laptop (HDMI-cable)</Name>
            </Value>
          </ValueSpace>
```

```
        </Widget>
      </Row>
      <Row>
        <Name> </Name>
        <Widget>
          <WidgetId>presentation_stop</WidgetId>
          <Name>Remove presentation</Name>
          <Type>Button</Type>
          <Options>size=4</Options>
        </Widget>
      </Row>
      <Options>hideRowNames=1</Options>
    </Page>
  </Panel>
</Extensions>
```

Appendix 2: The macro

```
The latest version of this file is available on Github at
https://github.com/CiscoDevNet/roomdevices-macros-samples/tree/master/Multi-
Content%20Solution

//version 1.1 - updated with new syntax and optimized for RoomOS 11

import xapi from 'xapi';


function StartPresentation(sources){
    xapi.Command.Presentation.Start({PresentationSource: sources});
}

function StopPresentation(){
      xapi.Command.Presentation.Stop();
      xapi.Command.UserInterface.Extensions.Widget.UnsetValue({ WidgetId:
'presentation_source' });
      xapi.Command.UserInterface.Extensions.Widget.UnsetValue({ WidgetId:
'presentation_source2' });
}

xapi.Event.UserInterface.Extensions.Widget.Action.on(event => {
  if (event.WidgetId === 'presentation_source' && event.Type === 'released') {
      xapi.Command.UserInterface.Extensions.Widget.UnsetValue({ WidgetId:
'presentation_source2' });
    switch (event.Value){
      case 'pacs_1':
        StartPresentation(2);
        break;
      case 'pacs_2':
        StartPresentation(3);
        break;
      case 'pc_1':
        StartPresentation(5);
        break;
      case 'pc_2':
        StartPresentation(6);
        break;
    }
  }
  if (event.WidgetId === 'presentation_source2' && event.Type === 'released') {
      xapi.Command.UserInterface.Extensions.Widget.UnsetValue({ WidgetId:
'presentation_source' });
    switch (event.Value){
      case '4_sources':
        StartPresentation([2,3,5,6]);
        break;
      case 'laptop':
        StartPresentation(4);
        break;
    }
  }
  else if (event.WidgetId === 'presentation_stop' && event.Type === 'clicked' ) {
    StopPresentation();
    }
```

```
    //console.log(JSON.stringify(event));
  }
);

xapi.Status.Conference.Presentation.Mode.on(presentationStatus =>{
  if (presentationStatus === 'Off' || presentationStatus === 'Receiving'){
      xapi.Command.UserInterface.Extensions.Widget.UnsetValue({ WidgetId:
'presentation_source' });
      xapi.Command.UserInterface.Extensions.Widget.UnsetValue({ WidgetId:
'presentation_source2' });
  }
});

xapi.Status.Standby.State.on(standbyState => {
  if (standbyState === "Off"){
    StopPresentation();
}});

StopPresentation();
```

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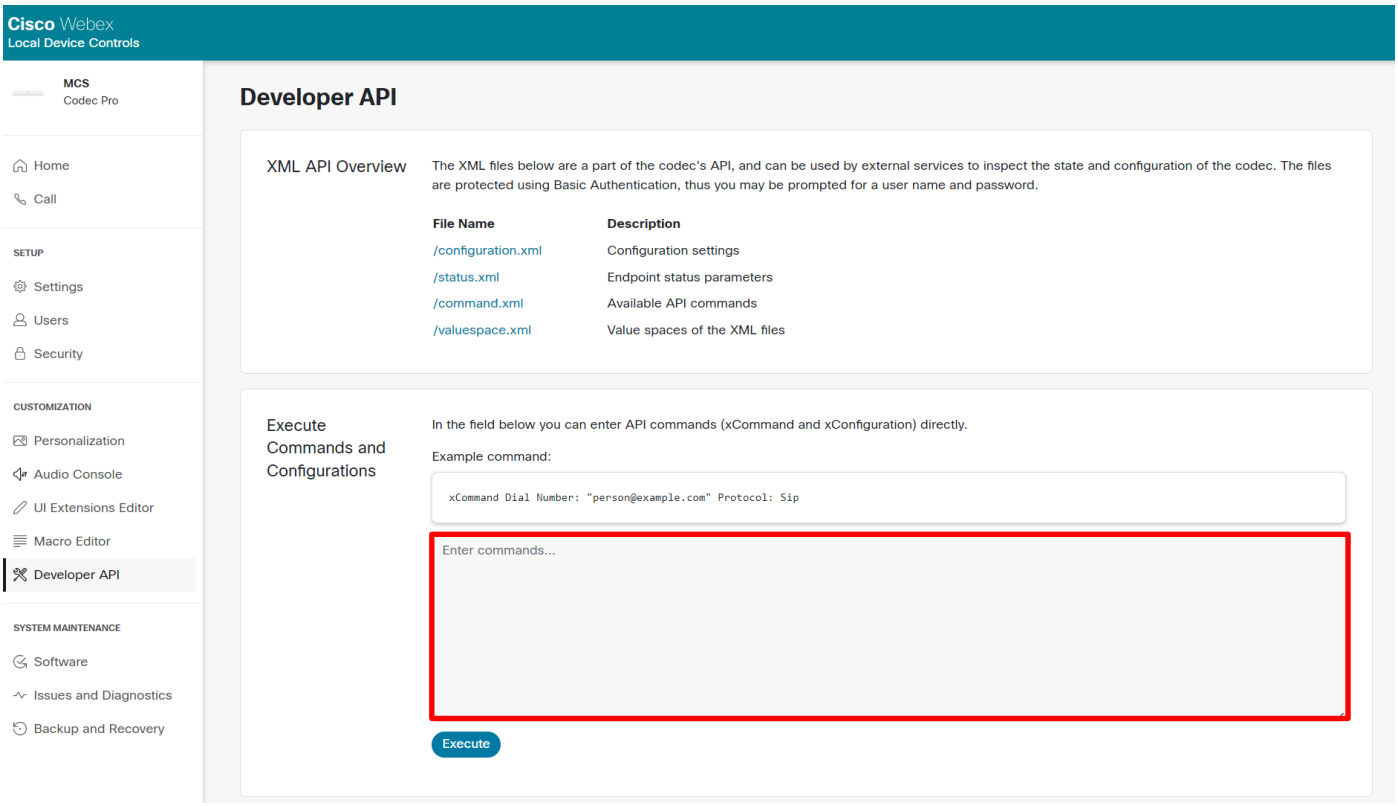
Appendix 3: **xConfigurations**

In this guide, a list of configurations have been mentioned. A quick way to set them all is to log in to the codec via SSH or open the Developer API in the Web interface:



You may simply paste the following configurations to set all settings mentioned in this guide:

xConfiguration Video Input Connector 2 InputSourceType: PC
xConfiguration Video Input Connector 2 Name: "PACS_1"
xConfiguration Video Input Connector 2 PreferredResolution: 1920_1080_60
xConfiguration Video Input Connector 2 PresentationSelection: Manual
xConfiguration Video Input Connector 2 Quality: Auto
xConfiguration Video Input Connector 2 Visibility: Never

xConfiguration Video Input Connector 3 InputSourceType: PC
xConfiguration Video Input Connector 3 Name: "PACS_2"
xConfiguration Video Input Connector 3 PreferredResolution: 1920_1080_60
xConfiguration Video Input Connector 3 PresentationSelection: Manual
xConfiguration Video Input Connector 3 Quality: Auto
xConfiguration Video Input Connector 3 Visibility: Never

xConfiguration Video Input Connector 4 InputSourceType: PC
xConfiguration Video Input Connector 4 Name: "Laptop"
xConfiguration Video Input Connector 4 PreferredResolution: 3840_2160_30

xConfiguration Video Input Connector 4 PresentationSelection: Manual
xConfiguration Video Input Connector 4 Quality: Auto
xConfiguration Video Input Connector 4 Visibility: Never

xConfiguration Video Input Connector 5 InputSourceType: PC
xConfiguration Video Input Connector 5 Name: "PC_1"
xConfiguration Video Input Connector 5 PreferredResolution: 1920_1080_60
xConfiguration Video Input Connector 5 PresentationSelection: Manual
xConfiguration Video Input Connector 5 Quality: Auto
xConfiguration Video Input Connector 5 Visibility: Never

xConfiguration Video Input Connector 6 InputSourceType: PC
xConfiguration Video Input Connector 6 Name: "PC_2"
xConfiguration Video Input Connector 6 PreferredResolution: 1920_1080_60
xConfiguration Video Input Connector 6 PresentationSelection: Manual
xConfiguration Video Input Connector 6 Quality: Auto
xConfiguration Video Input Connector 6 Visibility: Never

xConfiguration Audio Input HDMI 1 VideoAssociation MuteOnInactiveVideo: Off
xConfiguration Audio Input HDMI 2 VideoAssociation MuteOnInactiveVideo: Off
xConfiguration Audio Input HDMI 3 VideoAssociation MuteOnInactiveVideo: Off
xConfiguration Audio Input HDMI 4 VideoAssociation MuteOnInactiveVideo: Off
xConfiguration Audio Input HDMI 5 VideoAssociation MuteOnInactiveVideo: Off

Optional configurations:
xConfiguration UserInterface Features Call CameraControls: Auto
xConfiguration UserInterface Features Call End: Auto
xConfiguration UserInterface Features Call HdmiPassthrough: Auto
xConfiguration UserInterface Features Call JoinGoogleMeet: Hidden
xConfiguration UserInterface Features Call JoinMicrosoftTeams: Hidden
xConfiguration UserInterface Features Call JoinWebex: Auto
xConfiguration UserInterface Features Call JoinZoom: Hidden
xConfiguration UserInterface Features Call Keypad: Auto
xConfiguration UserInterface Features Call LayoutControls: Auto
xConfiguration UserInterface Features Call MidCallControls: Auto
xConfiguration UserInterface Features Call MusicMode: Hidden
xConfiguration UserInterface Features Call ParticipantList: Auto
xConfiguration UserInterface Features Call SelfviewControls: Auto
xConfiguration UserInterface Features Call Start: Auto
xConfiguration UserInterface Features Call VideoMute: Hidden
xConfiguration UserInterface Features HideAll: False
xConfiguration UserInterface Features Share Start: Hidden
xConfiguration UserInterface Help Tips: Hidden

xConfiguration UserInterface KeyTones Mode: Off
xConfiguration UserInterface SoundEffects Mode: Off