WAINHOUSE Research

Evaluation of Polycom RealPresence Trio ™

Hands-on testing of an all-in-one audio, content, and video conferencing device for small meeting rooms.

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Polycom®

Background

Founded in 1990 and headquartered in San Jose, California, Polycom is a privately-held [1] company that develops, manufactures, and markets video, voice, and content collaboration and communication products and services. The company employs approximately ~ 3,000 people and generates more than $1B in annual revenue.

Polycom has been in the conference phone business since the early 1990s[2], and to date has shipped more than six million analog and digital conference phones – all with the familiar Polycom three-legged "starfish" design (see images below).

In October 2015, Polycom announced the RealPresence Trio 8800 – a multi-function conferencing device intended for use in small, medium, and large meeting rooms.

Figure 1: Polycom SoundStation IP4000 (L) and Polycom RealPresence Trio 8800 (R)

In April 2017, Polycom commissioned the Wainhouse Research (WR) test team to perform a third-party assessment of the RealPresence Trio 8800 solution. This document contains the results of our hands-on testing.

Note – For readability and brevity's sake, throughout this document we will refer to the Polycom RealPresence Trio 8800 as the Trio 8800 or simply Trio.

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[1] Polycom was acquired by private equity firm Siris Capital in September 2016

[2] Source: https://en.wikipedia.org/wiki/Polycom#Polycom_audio_and_voice

Understanding RealPresence Trio 8800

Conference Phone

The Polycom RealPresence Trio 8800 Conference Phone is a feature-rich device that includes:

- An integrated 5" color touch user interface

- Support for wired and wireless (Wi-Fi) network connections

- Support for Power over Ethernet (PoE)

- Three (3) microphones providing ~ 6 meter / 20 foot coverage

- An integrated speaker with bass reflex port supporting a 100 – 22 kHz frequency range

- Native SIP-based telephony (requires SIP server or calling service)

- Call control functions (e.g. call transfer, hold, forward, pickup, do not disturb, etc.)

- Local five-way audio conferencing

- Polycom advanced audio algorithms, including HD Voice and NoiseBlock

- Ability to register as a Skype for Business (SfB) client (with SfB on-premises and Office 365 online deployments)[3]

- Bluetooth/NFC and USB speakerphone capabilities for use with personal devices (e.g. PC notebooks or mobile devices). WR refers to this function as "group add-on" capability.

The Trio 8800 Conference Phone has an MSRP of US $1,599 and is available from Polycom resellers and many retailers / e-tailers.

For those needing additional conference room coverage, the Trio Conference Phone can also be used with up to two (2) optional extension microphones (not included in the base price).

Collaboration Kit

The RealPresence Collaboration Kit is a bundle that includes the following:

- A Trio 8800 Conference Phone
- A Trio Visual+ accessory
- A Logitech webcam C930e

The Visual Collaboration Kit provides the following features:

Figure 2: Trio 8800 Collaboration Kit

- Wired and wireless content sharing at up to 1080p resolution at 30 fps
- Standards-based (SIP) and SfB video conferencing at up to 1080p resolution at 30 fps

The Trio 8800 Collaboration Kit has an MSRP of US $2,259.

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[3] According to Polycom, Trio 8800 was the first conference phone certified for use with Skype for Business and Office 365.

Hands-On Testing

System Installation and Registration

Physical Installation

Installing our demo Trio 8800 Collaboration Kit involved the following:

- Connecting a single network cable (with PoE) to the Trio 8800 Conference Phone
- Connecting a different network cable on the same network (with PoE) to the Visual+ accessory[4]
- Connecting the included Logitech C930e webcam to the Visual+ accessory via USB
- Connecting an HDMI cable between the Visual+ accessory and our display

The Trio Visual+ accessory ships with a VESA-compliant mounting plate that allows the unit to be installed on a wall or behind the meeting room display.

All in all, it took us less than 5 minutes to physically install the entire solution within our environment.

Note – Trio can also connect to the local network over Wi-Fi, however Wi-Fi mode supports audio calls only. For our testing, we opted for a wired network connection.

Registration

Trio boots up automatically once power is applied. Trio supports the following operating modes (referred to as "Base Profiles") that can be accessed via the device's on-screen or web UI:

1. Generic (Default Mode) – supports SIP audio / video calling (requires device to be properly provisioned and registered to a SIP server).[5]

2. Lync (Skype for Business) – provides users with a Skype for Business-style user interface (requires device to be registered to an on-premises or hosted Skype for Business server).

3. Skype USB Optimized – disables the system's SIP, SfB, and video capabilities, and allows Trio's mics and speakers to be used with a personal device (e.g. notebook) connected over USB. WR refers to this as "group add-on" mode as it makes a personal device suitable for group use.

Relevant Notes:

- For large scale deployments, Trio can be managed by a centralized provisioning and device management system (e.g. Polycom RealPresence Resource Manager or RPRM). This allows admins to bulk-provision Trio devices and configure numerous system settings including the on-screen UI. Only a small subset of basic settings can be accessed locally (via the device's on-screen menu or via the web UI).

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[4] The Visual+ accessory can also connect directly to the second Ethernet port of the Trio 8800 Conference Phone using a standard Ethernet cable, however PoE+ is required to support this configuration.

[5] To support video conferencing (requires Visual+ Kit), a video-capable SIP server (e.g. Polycom DMA) must be used.

- The Skype for Business USB Optimized Base Profile is a configuration intended for use with an external conferencing device (e.g. a Skype for Business Room System). In this mode, the touch UI only allows the user to adjust the volume, mute, and hang-up. All communications functions are controlled by the external conferencing device.

For the initial round of testing, we registered Trio to one of the SIP servers (in this case a Polycom DMA instance running on a virtual server) within our test environment. We then placed a quick SIP audio call to test our installation and configuration.
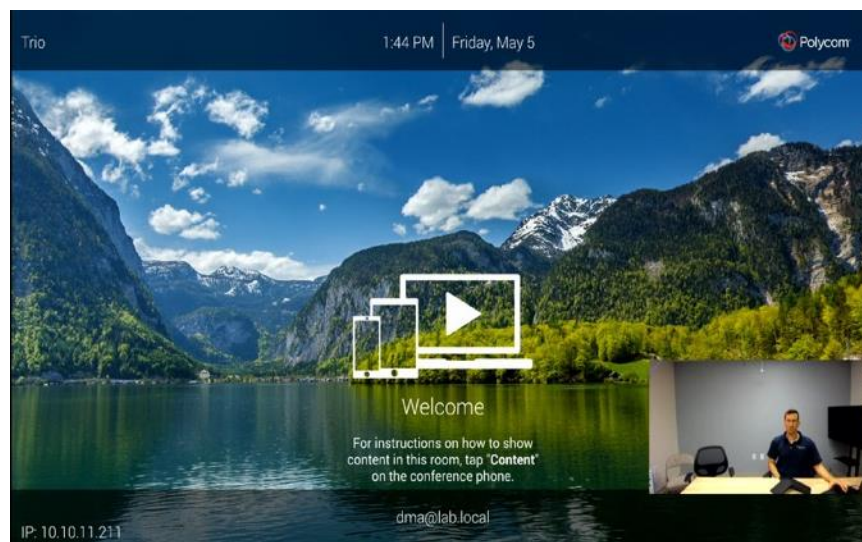
Visual+ Pairing

The Visual+ accessory does not have its own control UI. Instead, the Visual+ accessory is controlled by, and must be paired with, a Trio Conference Phone using a process similar to the way Bluetooth devices pair with each other.[6] This involves the following steps:

- Pressing the red LED "pair" button on the Visual+ to enter pairing mode.

- Selecting "Pair with New Device" from the Networked Devices menu on Trio. This causes Trio to discover and present a list of all Visual+ accessories currently in pairing mode on the same network subnet.

- Choosing the appropriate Visual+ accessory from the list on Trio Conference Phone's menu, and pressing "Complete" to finish the pairing process.

Once done, the LED light on the Visual+ accessory will turn green, and the connected display will show the home screen (see screenshot below) including the near-end camera view in a PiP window. In addition, a paired icon will be displayed on the Trio Conference Phone.

The above process took us less than 2 minutes to complete.

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[6] While pairing leverages Bluetooth, the data traffic moving between the Trio Conference Pone and the Visual+ accessory travels over the IP data network.

Note – to verify that you've paired with the proper Visual+ accessory, Trio includes an option to blink the red LEDs on the paired Visual+ accessory. We tested this feature to ensure that our devices were paired properly, and it worked as expected. For environments with numerous Trio deployments, this feature could be very helpful.

Trio Conference Phone User Interface

The Trio Conference Phone's touch UI consists of several rows of color icons, and the functions available to Trio users depend on the base profile in use - Generic (SIP) or Lync (Skype for Business).
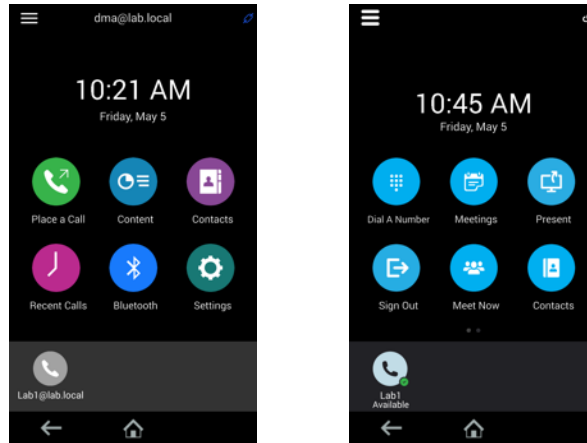

Figure 3: Trio Home Screen - Generic (SIP) Profile (L) and Lync (Skype for Business) Profile (R)

The table below highlights the functions available to Trio 8800 users with each base profile.

Base Profile	Menu Items Available (by default)	Comment
Generic (SIP)	Place a Call, Contacts, Recent Calls, Bluetooth, Settings	UI shows color icons for each option
Lync (Skype for Business)	Dial a Number, Meetings (calendar scheduling), Present, Sign In/Out, Meet Now, Contacts, Recent Calls, Bluetooth, Settings.	All icons are light blue with white lettering (the Skype for Business design language)

In addition, both base profiles offer an alternative UI view showing only a dial-pad, and users can jump between home page views at any time with a single button press.
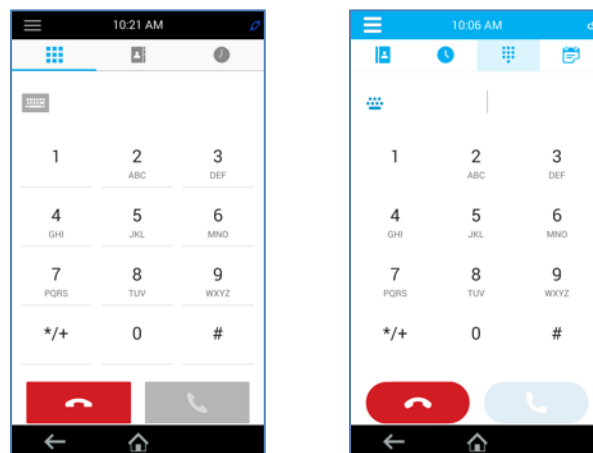

Figure 4: Dial-pad UI of Generic (SIP) and Lync (Skype for Business) Base Profiles

Overall, we found Trio's user interface to be extremely user friendly and intuitive to use.

Trio Meeting Experience

The RealPresence Trio Collaboration Kit supports the three most commonly requested functions for huddle room users: audio conferencing, local content sharing, and video conferencing.

Audio Conferencing

At its core, Trio looks and feels like a meeting room conference phone. To dial a call, users simply go the Place a Call screen (if that screen is not already the default), enter a standard phone number, and press the green Dial button. This same workflow applies to both the SIP operating mode and the Skype for Business operating mode.

To test the audio conferencing performance of the system, we placed numerous audio-only calls to both internal SIP phones (within our PBX environment) and to external phone numbers (via our SIP provider). We also tested Trio's ability to locally host up to a 5-way audio call.

We then switched Trio to the Lync (Skype for Business) base profile, registered the device to our Office 365 test account, and placed additional audio-only test calls.

Depending on the operating mode (SIP or Skype for Business), Trio also offers a variety of in-call functions such as mute, hold, call transfer, etc.

In all cases, Trio provided an excellent wide-band audio conferencing experience. Outgoing audio quality was very strong, even when the participants moved more than 4 meters from Trio Conference Phone. And Polycom's NoiseBlock feature (see WR's evaluation) kept non-human noises like paper shuffling or keyboard typing from impacting the call when nobody was speaking.

The incoming audio quality also did not disappoint, offering more than sufficient volume and faithful voice reproduction. Trio also passed our full-duplex test with flying colors.

Content Sharing (Local)

The Trio Collaboration Kit offers users numerous ways, depending on the base profile in use, to present content on the meeting room display.

Wireless Local Presentation / Content Sharing

To share content wirelessly from a notebook or tablet, Polycom offers two software options:

- **Polycom RealPresence Desktop and RealPresence Mobile** – available for PCs (RealPresence Desktop a.k.a. RPD for Windows / Mac) and mobile devices (RealPresence Mobile a.k.a. RPM for iOS / Android), this software supports video conferencing and wireless local content sharing on PCs and tablets (not smart phones).

Content Source	Wireless (local) content sharing in generic (SIP) base profile	Wireless (local) content sharing in Lync (SfB) base profile	Shareable Content
PC (Windows / Mac)	Yes	Yes	Entire desktop or single app
Tablet (iOS)	Yes	Yes	Local documents, photos, website, Dropbox
Tablet (Android)	No	No	

- **Polycom People+Content IP** – available for PCs (Windows, Mac), this software supports wireless and wired content sharing using both generic (SIP) and Lync (SfB) base profile.

Polycom does not currently support content sharing from smart phones (although smart phones participating in a call can receive shared content).

Overall, wireless content sharing from the various supported devices using both software apps worked as advertised, providing high quality content, albeit at a relatively low frame rate (~ 5 fps from a Mac PC, 10 – 15 fps from a Windows PC).

In addition, we discovered that People+Content IP for Mac supports resolutions up to 720p only.

Wired Presentation / Content Sharing
The People+Content IP software supports wired (via USB) content sharing from Windows and Mac PCs. We tested this function, and it worked as expected (with the same caveat of supporting up to 720p resolution only as stated above).

Key Takeaway
We expect Polycom video conferencing customers to leverage the Polycom RealPresence Desktop (RPD) and RealPresence Mobile (RPM) apps for content sharing with Trio. However, customers without existing Polycom video infrastructure, and those needing wired content sharing (e.g. for guests), will use People+Content IP.

Video Conferencing
The RealPresence Trio Collaboration Kit supports video conferencing at up to 1080p resolution at 30 fps in both SIP and Skype for Business operating modes. The table below highlights the various ways that Trio can join video calls.

Connection Method	Description	Generic (SIP) Base Profile	Lync (SfB) Base Profile
Manual Dial	Dial a SIP URI (e.g. peter@test.com)	Yes	Yes
Contact List	Select user / system to call from contact list	Yes (AD or LDAP)	Yes (from SfB)
Join Scheduled Call	Join a scheduled SfB call, to which Trio was invited, with a single click	No	Yes
Meet Now	Quick starts a SfB conference and allows dial-out to others via Trio's UI	No	Yes

SIP Testing (generic base profile)
For our first round of testing, we put Trio into the Generic (SIP) base profile and conducted SIP video calls between Trio and various software / hardware systems at speeds ranging from 512 kbps to 2 Mbps. For some calls, we dialed out from Trio. For others, we dialed into Trio.

While in a SIP video call, Trio users have access to a handful of features including mute (audio and/or video), enable / disable self-view, hold, transfer call, layout control (auto, gallery view, PiP, full screen), and audio-add (add up to five audio-only participants to the call).

In all cases, the SIP video conferencing experience provided by Trio was on-par or better than that provided by competing small meeting room solutions.

As shown in the table below, Trio supports various ways to send content to remote sites during a call.

Content Source	Content Sharing during a SIP Video Call using Generic (SIP) Base Profile
PC (Windows / Mac)	Yes – Using Polycom RealPresence Desktop or People+Content IP / USB
Tablet (iOS)	Yes – Using Polycom RealPresence Mobile
Tablet (Android)	Not Supported

We tested all of these capabilities and found they worked as expected.

Skype for Business Testing (Lync base profile)
We then put Trio into the Lync (Skype for Business) base profile and conducted point-to-point and multi-point (3 or more participant) test calls between Trio and Skype for Business users on PCs (Windows and Mac) and tablets (iOS and Android).

While in a SfB call, Trio users also have access to various features including mute (audio and/or video), enable / disable self-view, hold, layout control (auto, gallery view, PiP, full screen), and add additional participants (see screenshot at right).

Throughout our testing, Trio provided a solid Skype for Business video experience.

Testing Note - Trio does not currently allow users to send shared content during SfB calls. Instead, to share content during a SfB call, the user wishing to share content must connect to the same SfB conference from his personal device and share content directly to the SfB server (and not via Trio). We tested this method, and it worked as expected. However, this means that users will need to follow a different workflow to share content locally vs. share content with remote participants.

Group Add-On / Speakerphone Testing

Finally, we tested the ability to use Trio as a group add-on device in which Trio Conference Phone's mics and speakers can be used with a user's personal device (notebook PC, tablet, or smart phone). Trio supports two connection modes – USB and Bluetooth (including NFC).

Common use cases for group add-on mode include the ability for a user to:

- Run collaboration software on his notebook PC and leverage Trio's mics and speakers
- Place an audio call from his smart phone and leverage Trio's mics and speakers

We tested the use of Trio in group add-on mode with:

- Various personal devices - Windows and Mac notebooks, iOS and Android tablets, and iOS and Android smart phones

- Using both USB and Bluetooth connections (including NFC on Android devices)

- Using numerous collaboration tools including Skype for Business, Blue Jeans, WebEx, and Zoom.

In all cases, we were pleased with the results of our group add-on testing.

Analysis and Opinion

There's quite a lot to like about the Polycom RealPresence Trio Collaboration Kit combination.

First of all, Trio is quick and easy to install, and leverages standard enterprise telephony provisioning tools. And the device's conference phone form factor should make it familiar and approachable for most enterprise users.

The Trio Collaboration Kit supports the features most commonly requested in small (huddle) meeting rooms; audio conferencing, wired and wireless content sharing, and video conferencing. The ability to configure the device to act as either a SIP device or a native Skype for Business client is a real coup.

In terms of system performance, Trio did not disappoint. In a word, Trio's audio performance was exceptional during audio calls, video calls, and when used as a USB or Bluetooth speakerphone (group add-on mode) with personal devices and third-party collaboration software.

In addition, we were impressed by the SIP and SfB video conferencing experience provided by Trio, although we wish Trio could be used with other USB cameras (e.g. Logitech Brio, Huddly, or third-party motorized PTZ cameras).

On a more critical note, we found Trio's local and remote content sharing to be functional, but kludgy. Users should not have to think about which app or method to use for local vs. remote sharing, wired vs. wireless sharing, when sharing from a PC or tablet, or when using Trio in one mode or the other. Ideally, the same app or workflow would support all use cases.

Overall, the Polycom RealPresence Trio Collaboration Kit would be an excellent choice for organizations seeking a cost-effective, all-in-one device for small meeting rooms.

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Wainhouse Research, www.wainhouse.com, is an independent analyst firm that focuses on critical issues in the Unified Communications and Collaboration (UC&C). The company conducts multi-client and custom research studies, consults with end users on key implementation issues, publishes white papers and market statistics, and delivers public and private seminars as well as speaker presentations at industry group meetings.

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