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PRYSM®

Cascade Collaboration Solutions

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LPD™ Laser Phosphor Display

Contents

1. Solution Overview

Today's collaborative decision process is increasingly reliant upon combining data from multiple locations and sources in real time. Cascade collaboration solutions enable users to present, share, reposition, resize, annotate and edit all types of content through on-screen touch, PCs, or mobile devices. Multiple, simultaneous live inputs can be displayed and interacted with on screen including video, telepresence, and web apps. Configurable workspaces allow teams to share the use of a Cascade system with other groups, save their work between sessions, and pick up where they left off when they next meet.

With Cascade solutions, customers can implement true cloud-enabled collaboration rooms. Mirroring of workspaces between Cascade displays allows geographically distributed teams to simultaneously collaborate on all the content on screen. Projects and associated data are stored locally and in the cloud, so users can access their content from any Cascade system at any time. Cascade solutions integrate with customers' existing collaboration applications and infrastructure delivering greater team productivity and higher return on IT and facility investments.

Cascade collaboration solutions build on two integrated systems: collaboration end points and a collaboration cloud server. The collaboration end points feature touch-enabled Cascade video walls and displays available in 190, 117, 85 and 65 diagonal inches. With this range of choices, customers can realize a seamless collaboration experience in every size conference room, from the boardroom to the two-person huddle room, across the enterprise.

2. Collaboration End Points

Collaboration end points are the locations at which the Cascade displays and supporting AV gear are deployed. The collaboration end points offer the following features and capabilities:

- **Media and File Storage** – Common enterprise media objects and file types (images, video, Microsoft Office files, etc.) may be uploaded and stored at the endpoint. These files are automatically uploaded to the cloud and replicated across collaboration end points.

- **Live Video Source Integration** – Up to 16 live video sources may be integrated into the solution. Live video takes the form of video teleconferencing feeds (Cisco, Polycom, Microsoft Lync, etc.), TV, media players (Blu-ray, DVD, etc.), media streaming devices (Apple TV, Google Chromecast, etc.), or in-room devices (smartphones, tablets, laptops, PCs, etc.). Input of these sources is typically handled via standard HDMI and DVI interfaces. Popular third party solutions are employed to support the wireless transfer of video feeds from in-room devices to the Cascade video wall or display (screen sharing or device mirroring).

- **Interactive Input Control** – This feature allows a PC connected via a USB cable to be controlled directly from the Cascade video wall or display. Typically, a laptop computer's second display output is sent to the Cascade video wall or display as a live video source. Control of the laptop computer is then supported via a USB cable that connects the laptop computer to an appliance within the Cascade video wall or display. Users can interact with

this in-room PC directly from the Cascade video wall or display or via a wirelessly connected mouse/keyboard.

- **Remote Desktop Integration** – Industry standard remote desktop software is leveraged to support the display of remote PCs on the Cascade video wall or display. Users can interact with these remote PCs directly from the Cascade video wall or display or via a wirelessly connected mouse/keyboard.

- **Web Browser** – An integrated browser allows for the display of web content.

- **Whiteboard** – A touch-enabled whiteboard application allows for freeform drawing and annotation. A multi-site shared whiteboard experience is supported.

- **Markup and Annotation** – Any media object or file displayed on the Cascade video wall or display may be annotated by touch and saved for later reference.

- **Media and File Display** - Multiple media objects, files, web browsers, live video sources (TV, video conference, streaming media players), in-room devices (smartphones, tablets, PCs), remote PCs, etc. may be displayed on the Cascade video wall or display simultaneously.

- **Dynamic Content Layout** – Media and files can be freely moved and resized as desired by touch at the Cascade video wall or display or via a wirelessly connected mouse/keyboard. Sources can be opened and accessed simultaneously and scaled to the desired size.

- **Fixed Content Layout** – Media and files can be automatically snapped to specific locations on the Cascade video wall or display (snap grids). This feature allows standard layouts of media and files to be defined and recalled on demand.

- **Projects and Workspaces** – The collaboration experience is defined around projects and workspaces within projects. This feature allows different users/groups to save and return to their workspace and immediately pick-up from where they left off.

- **Real-time, Multi-site Collaboration** – Real-time and multi-site collaboration is supported on all media objects uploaded to the collaboration cloud server. Up to 10 collaboration end points can enter the same workspace and collaborate in real-time. Changes to the workspace by any user at any end point are automatically replicated across all other endpoints. The feature currently does not support the automatic routing of live video sources from one end point to another.

- **Control System Integration** – APIs are provided to facilitate integration with popular control systems (AMX, Crestron, Extron, etc.).

- **User Authentication** – User authentication is supported to ensure that only authorized parties have access to various projects and workspaces.

- **Customization** – Third party applications and/or control interfaces can be integrated directly into the solution subject to the availability of appropriate APIs (e.g., integration with video teleconference systems to place and receive calls, perform camera control operations, and access device address book information).

3. Collaboration Cloud Server

The collaboration cloud server plays an integral role in real-time, multi-site collaboration as well user and project provisioning. The collaboration cloud server offers the following features and capabilities:

- **Real-time, Multi-site Collaboration** – The collaboration cloud server enables real-time and multi-site collaboration. Multi-site collaboration is supported on all media objects uploaded to the collaboration cloud server. Up to 10 collaboration end points can enter the same workspace and collaborate in real-time. Changes to the workspace by any user at any end point are automatically replicated across all other endpoints. The feature currently does not support the automatic routing of live video sources from one end point to another. Since this feature operates on media objects that have already been replicated across endpoints, the real-time data transfer requirements are minimal (e.g., 1.5 Mbps bandwidth is sufficient).
- **Web Portal** – A Web application allows for the management of users, projects, and files within these projects:
    - Upload and delete projects and files using popular Internet browsers
    - Real-time synchronization of project and workspace data across connected collaboration end points
    - Bandwidth transfer in/out of the web application and data storage for both file content and project metadata (database) is included in the annual service fee
- **Hosting** - Content is hosted in Microsoft's Azure cloud.
- **Security** - All content is encrypted with military grade AES 256-bit encryption. The administration portal is encrypted with 128-bit SSL encryption.
- **On-Premises Private Server Appliance** – As an alternative to the cloud-based server, a private-hosted solution in the form of a pre-configured server appliance is available. The file storage component is flexible and can be configured to store files in locations other than the physical server appliance (a NAS, SAN or other mapped drive is usually the easiest form of implementing a storage solution outside of the appliance).
- **Standalone Collaboration Server** - For a standalone instance of the solution (no multi-point collaboration), the collaboration cloud server can be co-deployed on the collaboration appliance.

4. Technical Specifications

4.1. Hardware and Software

- Collaboration Software: Synthesis
- Size: 4 RU
- OS: Windows 8
- Processor: Single Intel I7 or Dual Intel Xenon
- RAM: 16 or 32 GB RAM
- HDD: 512 GB SSD
- Video Output:
  - Four (4) to twelve (12) video outputs
  - Up to 3840x2160 @ 60 fps
- Video Input (1 to 16):
  - HDMI 1.4a up to 1920x1080 @ 60 fps
  - SD/HD/3G-SDI up to 1920x1080 @ 60 fps
  - DVI up to 1920x1080 @ 60 fps; up to 4096x2160 @ 30 fps
  - VGA
  - YPbPr
  - CVBS
- Audio Output:
  - Audio that originates within Synthesis can be sent out either the analog or digital output interface of the appliance and is configured via the standard Microsoft Windows audio drivers
  - The appliance does not intercept or make available the audio that may be embedded on the video capture interfaces
- HDCP Support: HDCP compatible (full HDCP certification underway)
- Genlock Support: Available upon request.
- Expansion Chassis: Available upon request.

4.2. Network Bandwidth

Full-time Internet connectivity is required to enable data and file exchange between the Collaboration End Points and the Collaboration Cloud Server. Off-line configurations can be supported.

- Internet Bandwidth: Minimum of 1.5 Mbps
- LAN Bandwidth: Minimum of 100 Mbps
- Static IP: Static IP address on dedicated subnet

4.3. Interactive Input Controller – Supported Operating Systems

- Windows XP, (SP1, SP2)
- Windows 2000

- Windows 7
- Windows 8, 8.1 (update 1)
- Mac OS (10 and higher)
- Linux
- Unix
- Solaris
- BSD
- Sun OS
- NetWare

4.4. Media File Types

- Image Files:
  - PNG
  - JPG
  - GIF
- Video Files:
  - H.264 QuickTime video (.mov, .m4v, .mp4)
  - Windows Media Video (.wmv, .asf)

4.5. Wireless Device Mirroring

Popular third party solutions are employed to support the wireless transfer of video feeds from in-room devices to the Cascade video wall or display (screen sharing or device mirroring). These signals must be supplied to the collaboration appliance via a standard wired video connection (e.g., HDMI or DVI).

4.6. Web Browser

An integrated browser allows for the display of web content. The browser was designed to support websites compatible with the Google Chrome browser. Web applications designed to run in a browser are supported. Presently, any website 'pop-ups' will be rendered within the same window and may potentially obscure the originating web page. Any applications that require a plug-in must be documented and provisioned by Prysm as Synthesis does not provide an end user interface for the installation of plug-ins. Supported web content includes HTML5, H.264 video, Flash and Silverlight.

4.7. Video Teleconferencing

The solution can ingest video from Cisco, Polycom or most other codecs. Customization may include direct integrate with the video teleconference system to place and receive calls, perform camera control operations, and access device address book information.

- At least one (1) live video source input to display the videoconference window
- The videoconference codec must reside on the same network as the solution

- Content can be sent over the content channel of the videoconference codec to remote destinations

Video teleconferencing windows are not synchronized to remote endpoints. If you are viewing a video teleconference window on a Synthesis workspace, only the local system will see that window.

4.8. Remote Desktop Protocol

Remote Desktop Protocol (RDP) is a proprietary protocol developed by Microsoft and provides a user with a graphical interface to connect to another computer (remote computer) over a network connection. RDP client software is included within Synthesis for this purpose. The remote computer must run RDP server software. RDP servers are built into Windows operating systems; RDP servers for Unix and OS X are available. Microsoft currently refers to their official RDP server software as Remote Desktop Connection.

RDP remote desktop client windows are not synchronized across Synthesis endpoints. If you are viewing a remote desktop client window on a Synthesis workspace, only the local system will see that window.

RDP does not support multiple remote connections to the same desktop. Hence, if two or more Synthesis endpoints do not necessarily need to use the same user account on the remote computer (i.e., they don't need to see identical content on the remote computer), they can use distinct Windows user accounts on the remote computer and access the remote computer simultaneously. The limitation resides in them both being logged into the same Windows user session simultaneously.

If two or more Synthesis endpoints need to simultaneously interact with a remote computer (act as single user in the same account), VNC protocol should be used. The downside to VNC is performance and increased bandwidth usage, due to the algorithm not being as efficient as RDP.

When RDP is in use, when one user opens a file, it locked for other users connected to that server.

On screen touch events as well as keyboard/mouse events are transmitted via RDP.

4.9. Virtual Network Computing

Virtual Network Computing (VNC) is a graphical desktop sharing system that uses the Remote Frame Buffer protocol (RFB) to remotely control another computer. It transmits the keyboard and mouse events from one computer to another, relaying the graphical screen updates back in the other direction, over a network.   VNC client software is included within Synthesis for this purpose. The remote computer must run VNC server software.

VNC remote desktop client windows are not synchronized across Synthesis endpoints. If you are viewing a remote desktop client window on a Synthesis workspace, only the local system will see that window.

Unlike RDP, VNC does support multiple remote connections to the same desktop. Hence, if two or more Synthesis endpoints need to simultaneously interact with a remote computer (act as single user in the same account), VNC protocol should be used. The downside to VNC is performance and increased bandwidth usage, due to the algorithm not being as efficient as RDP.

On the other hand, if two or more Synthesis endpoints do not necessarily need to use the same user account on the remote computer (i.e., they don't need to see identical content on the remote computer), RDP should be utilized.

On screen touch events as well as keyboard/mouse events are transmitted via RDP.

4.10. Microsoft Active Directory Integration

Active Directory is a directory service that Microsoft developed for Windows domain networks. Active Directory is an extensible and scalable directory service that enables administrators to efficiently manage network resources. An Active Directory structure is an arrangement of information about objects. Each object represents a single entity—whether a user, a computer, a printer, or a group and its attributes. A directory, in the most generic sense, is a comprehensive listing of objects. A phone book is a type of directory that stores information about people, businesses, and government organizations. Phone books typically record names, addresses, and phone numbers. Active Directory is similar to a phone book in several ways, and it is far more flexible. Active Directory will store information about organizations, sites, systems, users, shares, and just about any other network object that you can imagine. Not all objects are as similar to each other as those stored in the phone book, so Active Directory includes the ability to record different types of information about different objects. Within the context of Synthesis, Active Directory integration typically facilitates the following operations:

- Enables user authentication against the corporate IT infrastructure
- Enables the presentation of network resources (remote computers, file servers, printers, etc.) based upon the rights assigned to each user
- Facilitates the management of the Synthesis appliance by corporate IT administrators
- Since Active Directory deployments are customized for each enterprise, the nature and scope of Synthesis integration with an enterprise's Active Directory system varies and is handled under the terms of a professional services agreement.

4.11. SharePoint Integration

Microsoft SharePoint is a browser-based collaboration and document management platform from Microsoft. It is a content management systems and enterprise information portal that facilities document and information sharing across an enterprise.

Within the context of Synthesis, SharePoint integration typically facilitates the following operations:

- Provide users with controlled access to structured information assets (intranet site, documents, etc.) based upon their assigned rights
- Provides users with content management services available on their personal desktops (e.g., versioning and check-in/check-out capability)
- Enables information search capabilities across enterprise databases

Since SharePoint deployments are customized for each enterprise, the nature and scope of Synthesis integration with an enterprise's SharePoint system varies and is handled under the terms of a professional services agreement.

4.12. Email Integration

Documents, images, and videos (with or without annotation) that are present within a Synthesis workspace can be emailed directly from the video wall. They are attached as a Portable Network Graphics (.png) file to an email which can be sent through a configurable SMTP server.

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