



VIA COLLAGE Deployment Guide



Infinite Ways to Collaborate



CONTENTS

Introduction	3
User Experience	3
Pre-Deployment Planning	3
Connectivity	3
Network Addressing	3
Network Segmentation Requirements	4
Wireless Networks	6
Wireless Bandwidth Scalability.....	6
TCP/IP Port Requirements	6
Network Integration	7
Microsoft Active Directory	7
Anti-Virus Software	7
Patch Management	7
Network Security - Surface Area	8
Bandwidth Requirements	8
Third Party Applications	8
Bandwidth Measurement Data – Single Presenter	9
Typical PowerPoint Presentation	9
Graphic Intensive PowerPoint Presentation	9
YouTube Video	10
Web Browsing	10
720p Multimedia Streaming.....	10
1080p Multimedia Streaming.....	11
Bandwidth Measurement Data – Multiple Presenters / Multiple Participants	12
Graphic PPT Presentation - One Presenter / One participant using “View Main Display”	12
Graphic PPT Presentation - One Presenter / Three participants using “View Main Display” .	12
YouTube 720p Video - One Presenter / Three participants using “View Main Display”	13
Bandwidth Patterns During Presenter Changes.....	13
Bandwidth Patterns During Collaboration / Whiteboard / Enable Control	14
Bandwidth Patterns During File Sharing Sessions	14
Conclusion.....	15

INTRODUCTION

VIA COLLAGE is a powerful, multifunction collaboration tool for enhancing meeting productivity. VIA COLLAGE is a fully-featured PC running Windows™ OS 7 that combines wireless and wired network connectivity with an HDMI input to accommodate multiple users running Windows, iOS™, Mac™, and Android™ platforms. Unique to VIA COLLAGE is a proprietary video streaming protocol for all users that ensures steady 60fps playback from PCs, laptops, and tablets.

As with any network-connected PC, you need to configure VIA COLLAGE to your particular IT requirements; specifically, network addresses, port addressing, firewalls, wired and wireless networks, and trusted/permitted users. To ensure you get the most out of your VIA COLLAGE, we've prepared this deployment guide that assists you in connecting VIA COLLAGE to your institution's wired and wireless networks.

To help you estimate bandwidth requirements, we've included graphs in this guide that show typical bandwidth usage and demand for a variety of VIA COLLAGE applications, including PowerPoint™ presentations, Web browsing, YouTube™ and other video streaming, file sharing, and collaboration/whiteboard operations. These graphs measure actual bandwidth used at the network switch for single and multiple users.

USER EXPERIENCE

VIA COLLAGE works with different PC and BYOD operating systems in two ways:

For desktop and laptop computers, executable files must be loaded and run. These files are stored on VIA COLLAGE and are accessible to anyone who browses to VIA COLLAGE's home page. Windows and Mac OS are both supported.

For tablets and smartphones, an app must first be downloaded. The app for iOS devices is available in the iTunes Store, while the app for Android devices can be found in Google Play.

Once the executable file or app is downloaded and launched, each user will be prompted for a user name and room code to access VIA COLLAGE. No further setup is required.

PRE-DEPLOYMENT PLANNING

Prior to deploying VIA COLLAGE, it is important to consider how the device integrates with your existing IT infrastructure. Depending on the complexity of your network and the level of integration you desire, there are several items you need to consider. This document provides you with the data you need so that you can deploy VIA COLLAGE in a way that best suits your existing IT environment.

CONNECTIVITY

NETWORK ADDRESSING

An IP address is the logical address used to identify a device on a network. The VIA COLLAGE needs a properly-configured static IP address to connect and communicate properly with other devices on the network. Obtain this address information from the network administrator responsible for the network.

A subnet mask is a number that is used in combination with the IP address to define what network addresses are on the local network segment. If a network address is local, the VIA COLLAGE can communicate with it directly. If a network address is not local, traffic from the VIA COLLAGE is sent to the default gateway address.

The default gateway address is the network address of a device that is responsible for forwarding network traffic to other network segments. This may be a firewall, router, or Layer 3 network switch.

Domain Name System (DNS) servers translate names like `www.KramerElectronics.com` into IP addresses. For example, as of this writing, the DNS name `www.KramerElectronics.com` translates to IP address: `23.62.6.162`.

To use a DNS name rather than an IP address for your room name, your network administrator must create one for your VIA COLLAGE. For example, if you use an internal default domain name for all of your connected clients (such as `domain.lan`), you could configure a DNS map for `Room1.domain.lan` that points to the static IP address assigned to the VIA COLLAGE.

As long as connected clients are (1) able to resolve that DNS name by using the DNS map your network administrator configured and (2) the clients have the default domain name of `domain.lan` assigned to them, they can use the DNS name "Room1" to connect, rather than the static IP address assigned to the VIA COLLAGE.

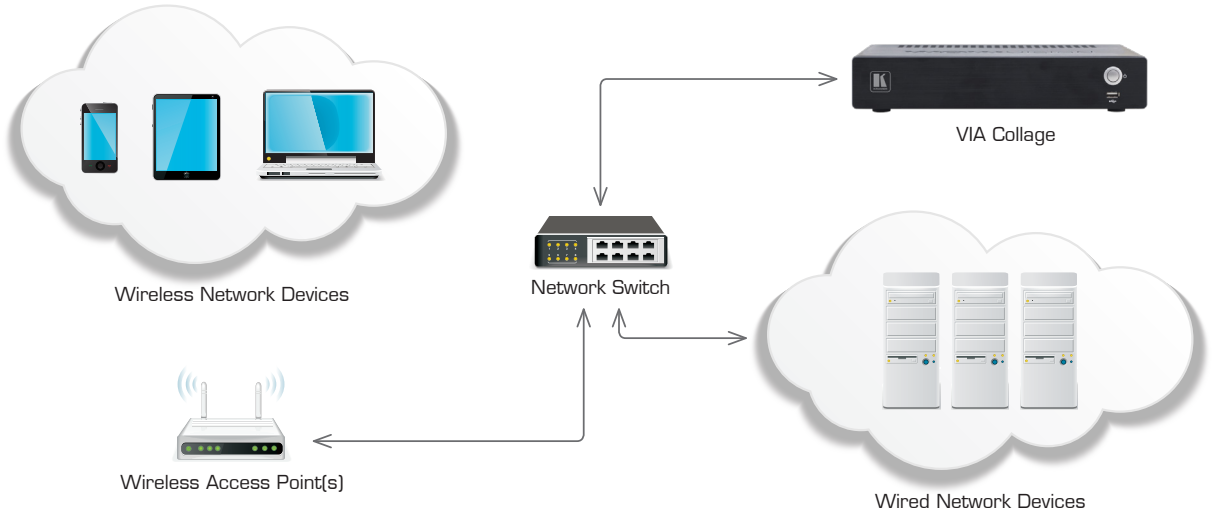
NOTE: As of now, you must configure the VIA COLLAGE with a static IP address. DHCP IP addresses and reservations are not presently supported in VIA COLLAGE.

NETWORK SEGMENTATION REQUIREMENTS

A network segment is a logically-separated group of network devices with each group configured as sub-networks or subnets. For devices on one subnet to communicate with devices on another subnet, access control lists or firewall rules may need to be configured.

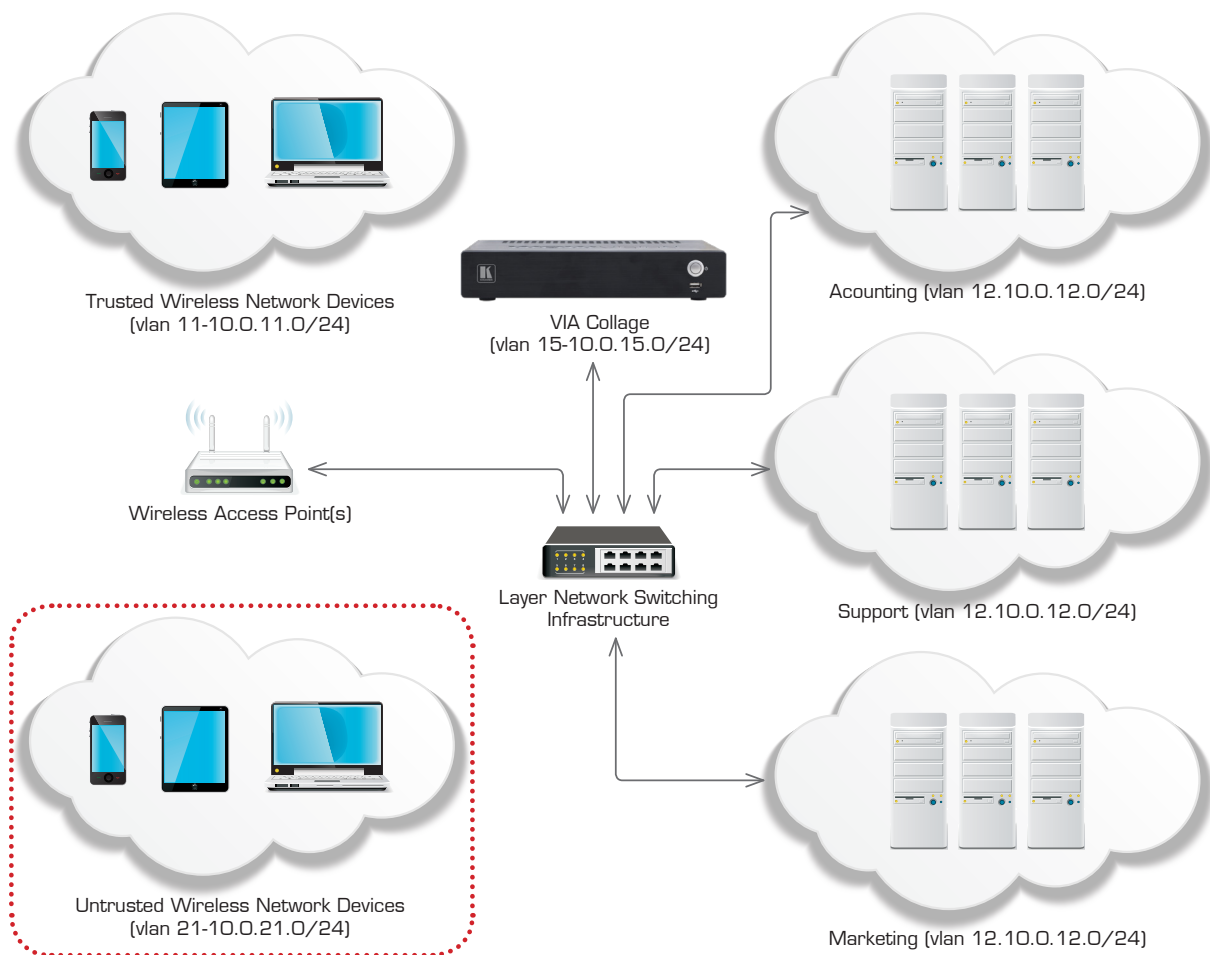
FLAT (NON-SEGMENTED) NETWORKS

Smaller networks may not have network segmentation. In that case, connect the VIA COLLAGE to your network and your other IP-connected devices on that network – wired or wireless - can see and interact with it, with little or no network configuration required.



SEGMENTED NETWORKS

Larger networks are usually segmented. For example, your network might have trusted network segments where devices owned and controlled by your organization are connected. However, you might also have an untrusted wireless network to which guests are allowed to connect their devices. Even basic segmentation of your network requires some planning to determine what network segment is best to connect to the VIA COLLAGE. Connecting the VIA COLLAGE to its own network segment may offer you the best ability to granularly control access to and from the VIA COLLAGE from other segments on your network.



Note: VLANs and IP addresses listed in the graphic above are for example purposes only.

You can connect the VIA COLLAGE to any segment of your network as long as traffic to and from the VIA COLLAGE can reach connected clients, along with any other resources that you'd want VIA COLLAGE to access.

VIA COLLAGE supports different VLANs and/or different IP subnets. However, all network segments must be connected via routed subnets and may not have any devices translating network addresses (NAT) between the VIA COLLAGE and connected clients. Clients connected to a network segment that makes use of network address translation between the client and the VIA COLLAGE do not work properly and are unsupported.

WIRELESS NETWORKS

The VIA COLLAGE fully supports clients that are connected by either wired or wireless networks. When dealing with clients connected by a wireless network, it is particularly important to make sure that these wireless clients have sufficient bandwidth through all wireless access points into VIA COLLAGE.

In deployments where the VIA COLLAGE is used by a small number of connected clients, a single high-quality, commercial-grade wireless access point that supports the 802.11N or 802.11AC wireless standards should be sufficient. In deployments where more than ten users will be connecting to the VIA COLLAGE wirelessly, check with wireless network administrators to ensure sufficient bandwidth is available.

WIRELESS BANDWIDTH SCALABILITY

When VIA COLLAGE is used by a large number of meeting participants, it is important that the network connecting VIA COLLAGE and participants has sufficient bandwidth.

One common problem is overloading of wireless access points. Example: If VIA COLLAGE is used for a collaborative session where the stepped-in presenter is doing Web browsing while 50 connected clients use the "view main display" function of the VIA client software, the wireless network must support all 51 of the sessions (1 presenter + 50 clients) and allow for approximately 5 Mb/s of bandwidth between the VIA COLLAGE and each connected client. In this scenario, up to 255 Mb/s of bandwidth would be used between the VIA and connected clients simultaneously.

In this case, the best option would be to use multiple commercial-grade wireless access points in order to spread the wireless bandwidth load over multiple access points. Check with your network administrators to be sure that sufficient wireless bandwidth is available for connecting VIA COLLAGE.

TCP/IP PORT REQUIREMENTS

TCP/IP ports are numbers that are assigned to user sessions and server applications in a TCP/IP network.

The VIA COLLAGE must be able to communicate with connected clients using TCP/IP traffic on the ports listed in the table below. If you have one or more network segmentation device(s) between the VIA COLLAGE and connected clients, the following traffic must be allowed in order for the VIA COLLAGE to function properly.

Since network traffic can be blocked at multiple levels by (a) software firewalls running on client devices or (b) on hardware devices that are part of the underlying network infrastructure, make sure that all firewalls or network segmentation devices between connected clients and the VIA COLLAGE allow traffic on the following ports:

TRAFFIC FROM CLIENT DEVICES TO VIA COLLAGE	TRAFFIC FROM VIA COLLAGE TO CLIENT DEVICES
Port 5222 TCP (Authentication and communication between clients and VIA [TLS/SSL enabled])	Ports 9954 and 3500-3599 TCP (StreamingServer.exe – Windows)
Port 9984 TCP (Streaming player)	Port 9991 TCP
Port 7777 TCP (File sharing server)	(WOWMauseCapture.exe – Windows)
Ports 9987, 9990, 9993 TCP (Step-in data)	Ports 9990 and 9993 TCP
Ports 7001-7024 UDP/RTP (Audio transfer)	

NETWORK INTEGRATION

VIA COLLAGE platform runs the Windows 7 Operating System on top of proprietary hardware, which means the VIA COLLAGE can be easily integrated into your existing I.T. environment. Many of the technologies you may already use today to manage and protect your network can be leveraged to help you efficiently manage VIA COLLAGE.

MICROSOFT ACTIVE DIRECTORY

Microsoft Active Directory can be leveraged to populate the Moderator and User databases when the VIA COLLAGE is to be used in Presentation Mode. Presentation Mode establishes a Moderator and User environment to ensure that meeting control is always maintained. Supplemental application note is available to aid in the integration of Active Directory.

ANTI-VIRUS SOFTWARE

Many organizations run organization-wide managed security software. Since the VIA COLLAGE runs Windows 7, you can deploy your normal managed security software to VIA COLLAGE. If your security software includes a software firewall, it is important for you to review the port requirements listed above and create any necessary exceptions.

It is important that antivirus software not use more than 5% of the VIA COLLAGE CPU, to make sure that it performs properly. If you would like to run periodic, scheduled scans of VIA COLLAGE, we would suggest that you schedule those scans to run during “off” hours when VIA COLLAGE is not in use.

PATCH MANAGEMENT

Patch management systems are often used by larger organizations to centrally manage the process of applying software patches to computers. These systems allow administrators to apply patches to groups of computers without dealing with each computer on an individual basis. These systems also have reporting functions that allow administrators to determine which machines on their network are missing important patches.

The VIA COLLAGE does not require that you connect it to a third party patch management system; however if your network already uses one, it can work with VIA COLLAGE.

The VIA COLLAGE ships with Windows Update turned off by default, so that an update does not happen while a presentation is in progress. However, where VIA COLLAGE is not connected to a network wide patch management system, Windows Update should be enabled and scheduled to run at a time when no one is using the VIA COLLAGE.

NETWORK SECURITY - SURFACE AREA

From a network security perspective, client computers (devices that access network services) and servers (devices that provide network services) are often treated differently. Servers, by design, run services that connect to other clients. Therefore, those services cannot be blocked at a network level if the server is to perform its function. This makes keeping security patches updated on server devices all the more important.

While the VIA COLLAGE does run Windows 7, it also runs application server software that connects clients. From time to time, Kramer may release updates for VIA COLLAGE application software to deal with underlying application level security issues with the VIA software itself as well as with third party applications that come bundled with VIA COLLAGE.

BANDWIDTH REQUIREMENTS

In order for a device to operate properly on a network, it must have sufficient bandwidth to communicate with the other devices on the network. The amount of bandwidth required depends heavily on how the device will be used.

In order to assist you with properly planning your VIA COLLAGE deployment, we have tested the VIA COLLAGE in a variety of different scenarios and collected real-world bandwidth use data. After carefully reviewing this data, we have outlined some general bandwidth recommendations that help you properly size the bandwidth needs for your particular VIA deployment. These recommendations are suggested minimums for the amount of bandwidth needed between a connected client and the VIA COLLAGE. These recommendations are given on a per-client basis.

- PowerPoint presentation display, document review, etc. – 1 Mbps per client
- Web browsing – 5 Mbps per client
- Video/multimedia streaming – 25 Mbps per client

Clients connected to the VIA COLLAGE that are not actively stepped in, using the “view main display” function, or actively sharing files use a minimal amount of bandwidth.

All network traffic to and from the VIA COLLAGE, including video streaming, is unicast traffic. The bandwidth requirements of the VIA COLLAGE scale linearly based on the number of users stepped in or using the “view main display” function of the VIA client app. Therefore, two clients stepped in at the same time would require roughly double the bandwidth as one stepped-in client would require.

THIRD-PARTY APPLICATIONS

The VIA COLLAGE ships with Skype and WebEx applications included. Review the specific requirements for these applications if you intend to use them with your VIA COLLAGE.

- Skype
<https://support.skype.com/en/faq/FA1417/how-much-bandwidth-does-skype-need>
- WebEx
<http://www.webex.com/webexconnect/orgadmin/help/index.htm?toc.htm?17161.htm>

BANDWIDTH MEASUREMENT DATA: SINGLE PRESENTER

In addition to these summary suggestions, we provide you with the following detailed bandwidth graphs that show real-world VIA COLLAGE bandwidth use in a variety of scenarios.

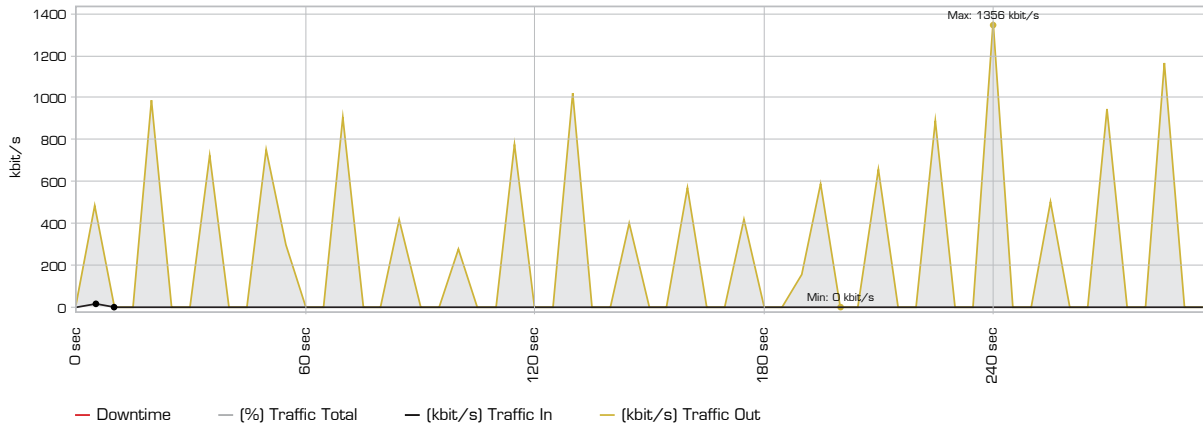
Traffic was measured at the network switch port. For the purposes of these graphs, “traffic out” is defined as traffic being sent from the switch to VIA, and “traffic in” is defined as traffic sent from VIA to the network switch.

TYPICAL POWERPOINT PRESENTATION



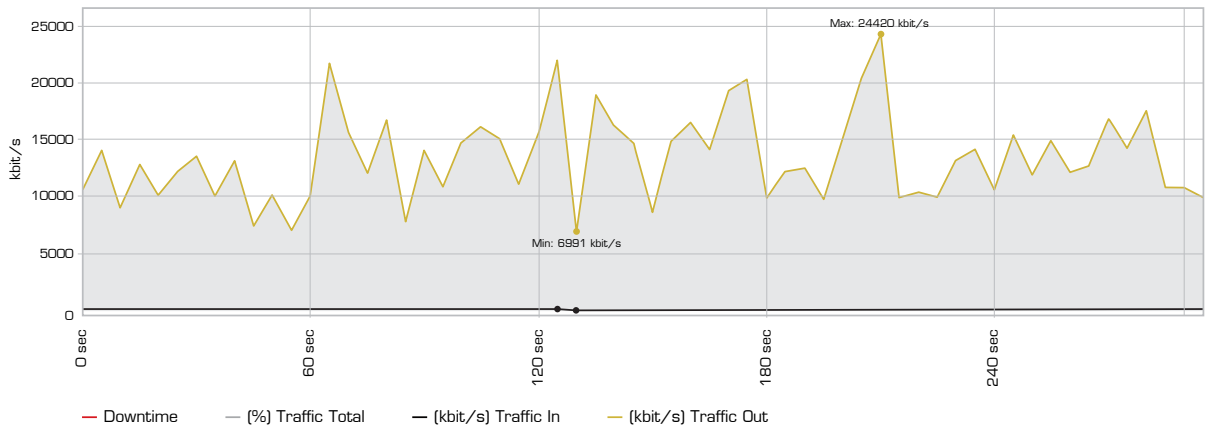
Slides with text and a few graphics are displayed on the VIA main display by a single connected client. Slides were advanced approximately once every 15 seconds.

GRAPHIC INTENSIVE POWERPOINT PRESENTATION



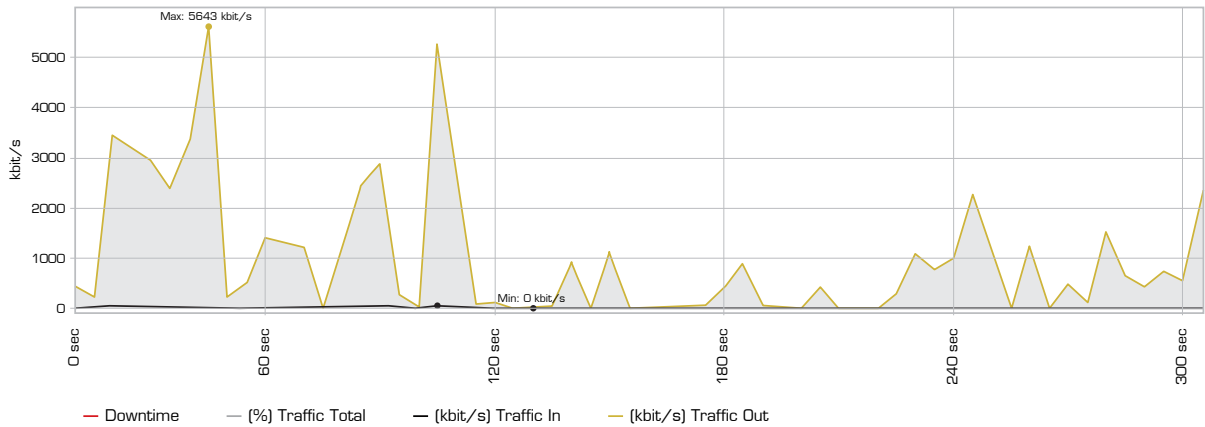
Slides consisting of heavy graphics are displayed on the VIA main display by a single connected client. Slides were advanced once every 15 seconds.

YOUTUBE VIDEO



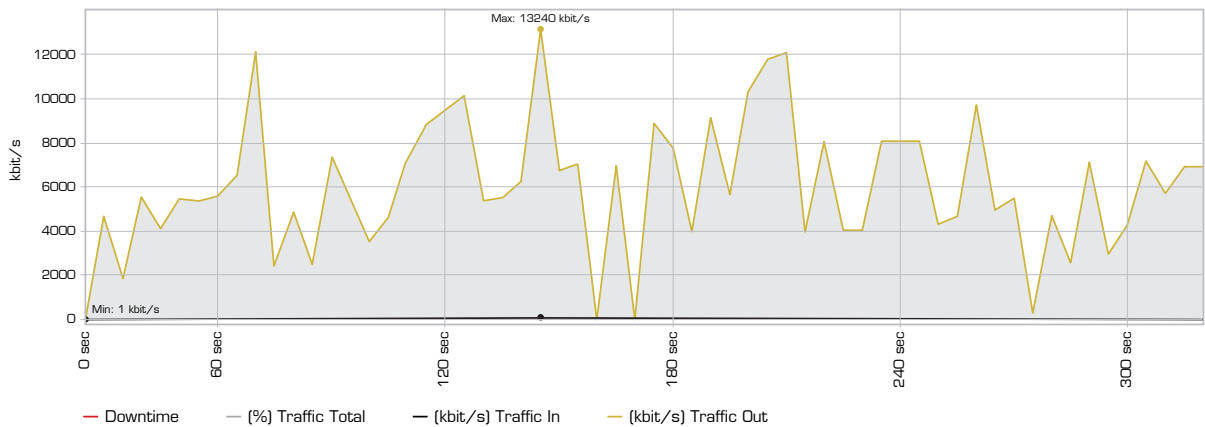
YouTube 720P video is displayed full screen on the VIA main display by a connected client.

WEB BROWSING



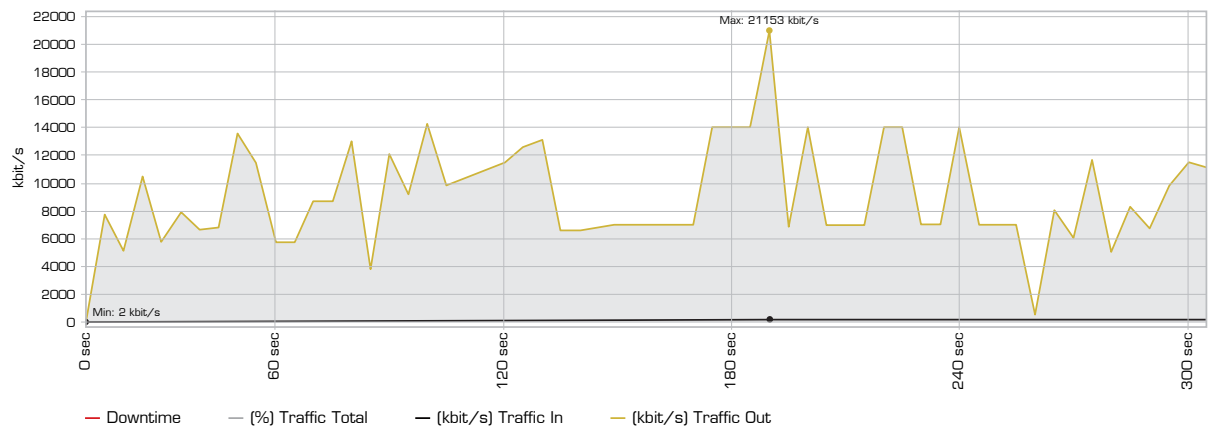
Random web browsing is displayed on the VIA main display by a connected client. Bandwidth spikes are generally attributable to animations or embedded video on the visited sites.

720P MULTIMEDIA STREAMING



720p video is streamed and displayed on the VIA main display by a connected client.

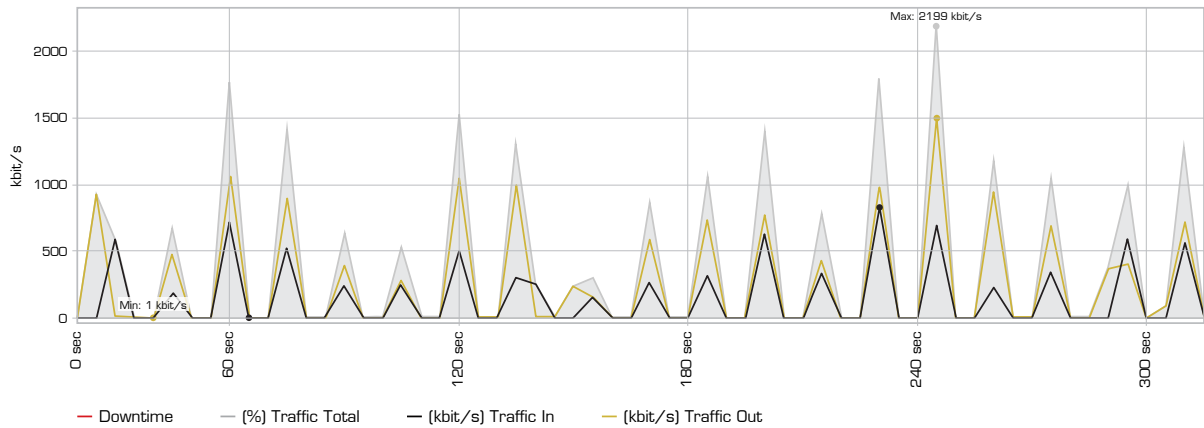
1080P MULTIMEDIA STREAMING



1080p video is streamed and displayed on the VIA main display by a connected client.

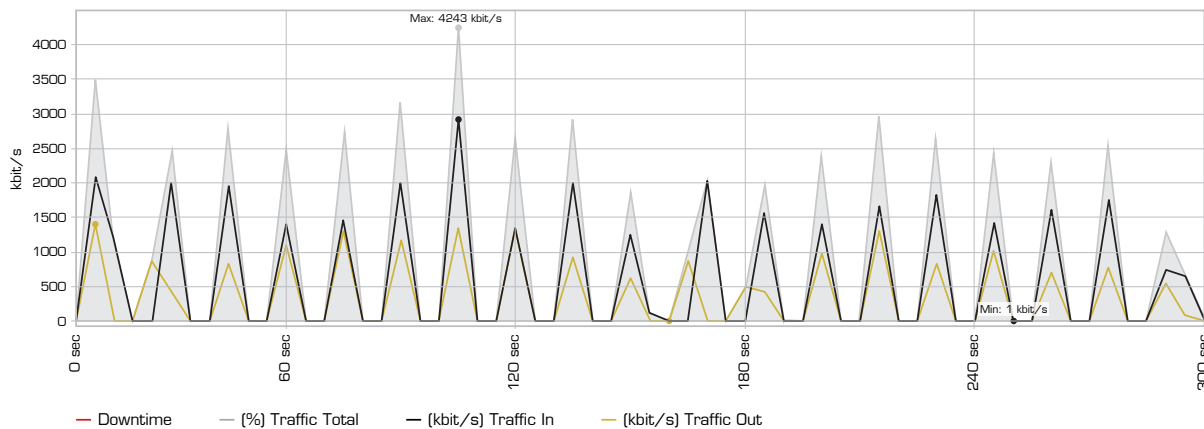
BANDWIDTH MEASUREMENT DATA: MULTIPLE PRESENTERS / MULTIPLE PARTICIPANTS

GRAPHIC INTENSIVE POWERPOINT PRESENTATION:
ONE PRESENTER / ONE PARTICIPANT USING "VIEW MAIN DISPLAY"



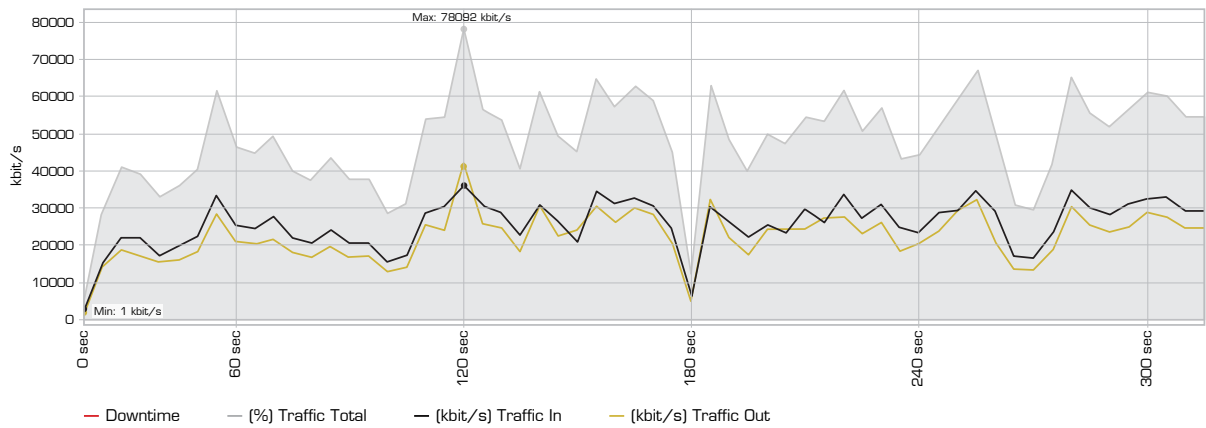
Slides consisting of heavy graphics is displayed on the VIA main display by a single connected client and being viewed by a single connected participant using the "View Main Display" function simultaneously. Slides were advanced once every 15 seconds.

GRAPHIC INTENSIVE POWERPOINT PRESENTATION:
ONE PRESENTER / THREE PARTICIPANTS USING "VIEW MAIN DISPLAY"



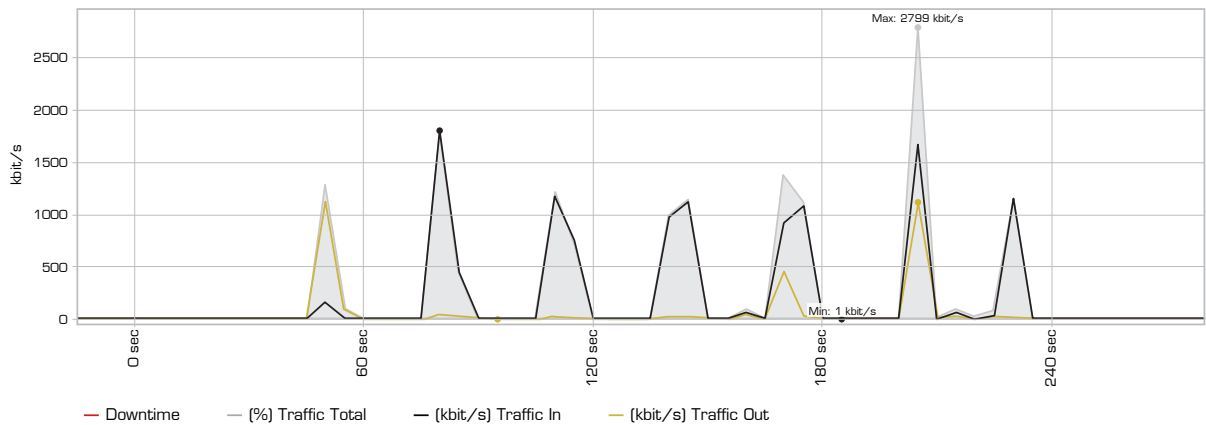
Slides consisting of heavy graphics is displayed on the VIA main display by a single connected client and being viewed by three participants using the "View Main Display" function simultaneously. Slides were advanced once every 15 seconds.

**YOUTUBE 720P VIDEO:
ONE PRESENTER / THREE PARTICIPANTS USING "VIEW MAIN DISPLAY"**



YouTube 720P video is displayed full screen on the VIA main display by a connected client while being watched by three connected participants using the "View Main Display" function simultaneously.

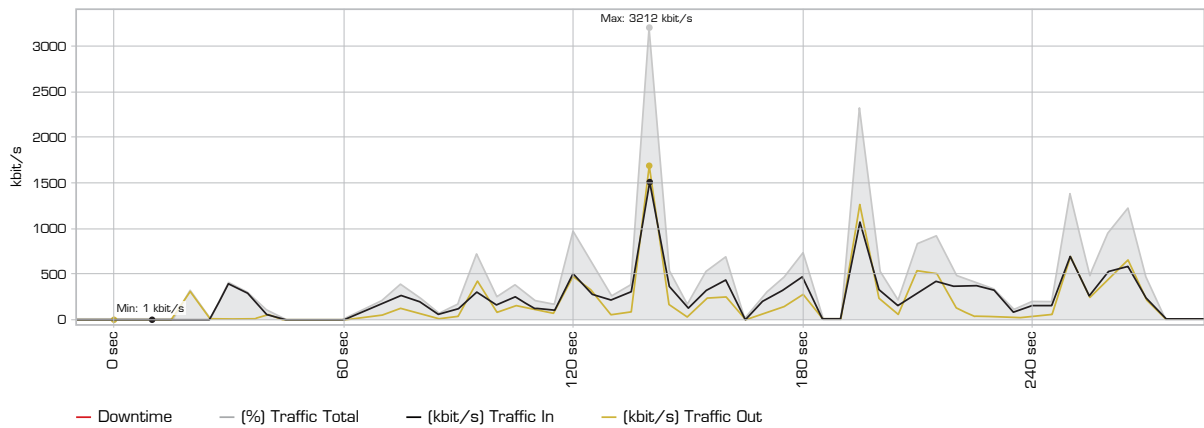
BANDWIDTH PATTERNS DURING PRESENTER CHANGES



When presenters change, a momentary bandwidth spike occurs. In this example, one presenter was stepped in, and one by one, other participants joined until a total of four other participants were using the "view main display" function of the VIA COLLAGE client software on their devices.

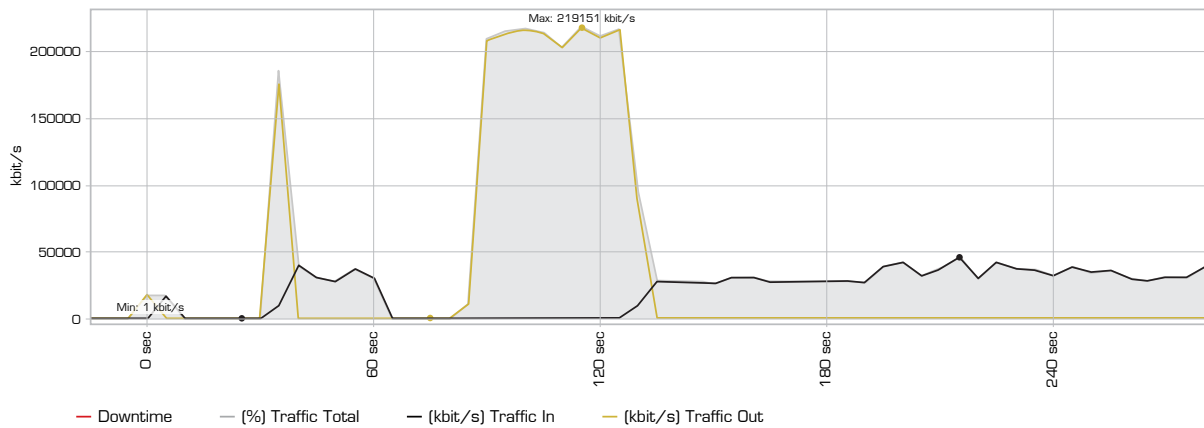
Just after 5:17PM, one presenter stepped out and a new presenter stepped in. This caused a momentary spike in bandwidth usage while the screens of all of the connected devices were refreshed.

BANDWIDTH PATTERNS DURING COLLABORATION / WHITEBOARD / ENABLE CONTROL



The VIA COLLAGE allows multiple participants to whiteboard and share control of a stepped-in member's device. The bandwidth graph below shows a session where one user was stepped in and allowed the other users to control their machine remotely and whiteboard collaboratively.

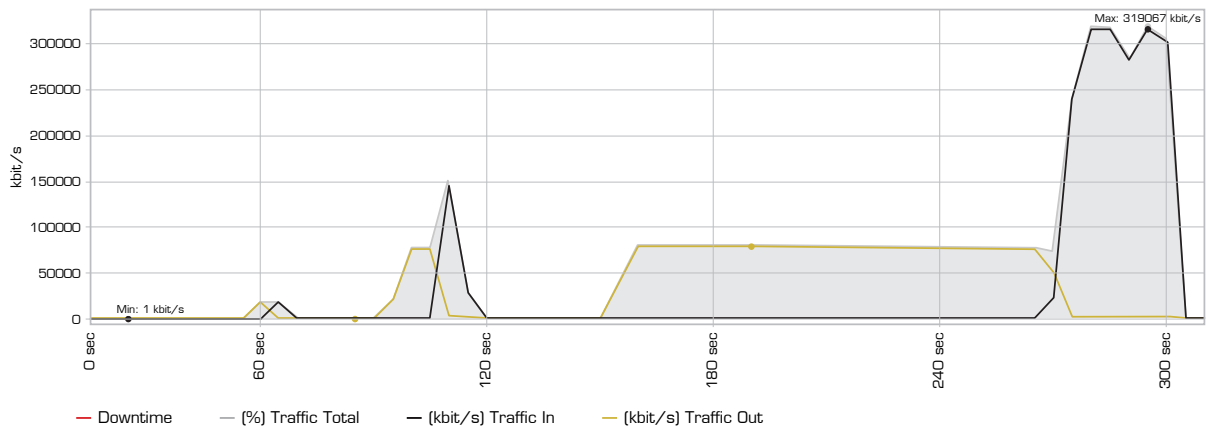
BANDWIDTH PATTERNS DURING FILE SHARING SESSIONS



The VIA COLLAGE can be used to easily transfer files between participants. From a network perspective, the speed of the transfers is limited by the amount of available bandwidth between VIA COLLAGE and connected client devices.

The graph below shows a series of files (10MB, then 100MB, then 1,024MB) uploaded by a computer with a Gigabit Ethernet connection and then downloaded by a computer with a 100 Mb/s connection.

The graph below shows the same series of files (10MB, then 100MB, then 1,024MB) uploaded by a computer with a 100 Mb/s network connection and downloaded by a computer with a Gigabit Ethernet connection.



As seen in these graphs, the available bandwidth between the VIA COLLAGE and the devices is the major constraint on the speed of the file transfers. The VIA COLLAGE platform does not affect bandwidth until data speeds of 200 Mbps are reached. This constraint only becomes an issue during the transfer of very large files or during the transfer of files to a very large number of participants.

CONCLUSION

We hope this deployment guide has been helpful in installing and configuring your VIA COLLAGE. Once installed, VIA COLLAGE should operate just like any other computing platform on your network. If you have further questions about or require assistance with network configuration, contact your local Kramer sales support engineer or Kramer technical support.



Kramer Electronics LTD.