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VAINHOUSE Research

Evaluation of the Blue Jeans Network (BJN) Video Collaboration Service

Hands-on testing of one of the leading cloud-based video conferencing bridging services

Background

Founded in 2009 by Krish Ramakrishnan (serial entrepreneur, ex-GM at Cisco, and current CEO) and Alagu Periyannan (experienced product development manager, ex-CTO at Blue Coat Systems, and current CTO), California-based Blue Jeans Network (a.k.a. Blue Jeans or BJN) aims to make video communications easy. As of this writing, BJN has ~400 employees distributed across its three offices in California, its development office in Bangalore India, and its various sales offices around the world.

BJN offers a meet-me video bridging service designed from the ground-up as a cloud-based service. The company's original claim to fame was its professional and scalable integration with Skype. Soon after, the company added support for Lync, Jabber, and browser clients. In 2013, Microsoft informed Blue Jeans that as of late 2013, the "SkypeKit" APIs would no longer be supported. For this reason, BJN stopped supporting Skype interop. However, according to the company, the transition away from Skype has been smooth as customers prefer the BJN web browser experience.

The BJN service is comprised of five (5) PoPs (2 in the US, 1 in EMEA (Amsterdam), 1 in Asia (Singapore), and 1 in Australia) connected over a dedicated IP network. The service uses a single redundant database for all users, and calls are hosted on the closest PoP (based on the host user's IP address). Within each PoP, traffic is distributed using load balanced clusters across redundant servers. To optimize the call experience, BJN has direct peering arrangements with several network providers including Comcast and Level 3. BJN also has direct connections in place with West IP / Intercall.

Since its inception, BJN has closed almost $100M of funding in three rounds (Nov 2009 Series A for $5.5M, April 2011 Series B for $18M, and June 2012 Series C for $25M, and September 2013 Series D for $50M) from VC investors NEA, Accel, Norwest Venture Partners, and Battery Ventures.

Blue Jeans Network sells its video bridging service in two ways – directly to end-users (via its direct sales force) and via a network of reseller partners. Key end-user reference accounts include Facebook, Match.com, foursquare, BCNet, Stanford University, Netflix, Red Hat, Rosetta Stone, and Pandora. Key reseller partners include AT&T, Telstra, Level3, Arkadin, InterCall, IVCi, and CDW.

As is often the case, many of the companies that believe they compete against BJN also partner with BJN and resell the BJN service. This friendly (or not so friendly) co-opetition is especially rampant among the video resellers and managed service providers who not only offer their own bridging service, but also offer BJN as a highly interoperable alternative. WR is aware of many video resellers who initially resold the BJN service but now lead with their own service.

In late 2014, WR contacted BJN and asked for a company account to allow WR to evaluate BJN's collaboration service. Soon after, WR participated in BJN's standard customer onboarding process and started our hands-on testing. This document contains the results of our independent, third-party testing, and our overall opinions of the BJN service.

To be clear, BJN did NOT pay WR to evaluate its service. After reviewing our final test results for accuracy, BJN licensed this document for public distribution.

Understanding the Blue Jeans Service

Blue Jeans Network offers a hosted / cloud-based multipoint video bridging service that supports content sharing and up to 1080p video resolution (depending on the video endpoint / client used).

The "standard" BJN service package provides each paying BJN user with unlimited access to a 25-participant (by default) personal virtual meeting room (VMR) in the sky. However, the company offers a number of power features to enhance the meeting experience such as:

Feature / Function	Description
Web Portal	The BJN web portal supports numerous different access levels including: 1) Admin – allows company administrators to manage company-wide settings, manage users, and view company-wide usage reports. 2) User – allows conferencing users to manage their account settings, schedule and/or start video meetings, or join meetings hosted by others. 3) Guest – allows guests (non-BJN users) to join BJN video meetings using a user-friendly web interface.
Meeting Scheduling Options	Allows BJN users to schedule video meetings in several ways including: - Using the BJN web portal (accessed directly or by clicking on the BJN icon from within Safari / Chrome browsers with BJN extension installed) - Using Microsoft Outlook (requires a plug-in) - Using Google Calendar (requires a Google Chrome extension)
Connectivity Options	The BJN service supports a wide range of connectivity options including: - Using a Web browser (requires the installation of a BJN plug-in) - Using any SIP / H323 hardware or software endpoint (may require NAT / FW traversal) - Using a Lync client (may require federating) - Using the BJN mobile app - Using any standard telephone (PSTN)
Call Recording	Allows meeting hosts to record video meetings and access archived recordings via the Blue Jeans portal.
Video Sharing	Allows meeting hosts to upload videos files to the Blue Jeans portal and subsequently share (play back) those video clips during video meetings.
Command Center (optional)	Provides company administrators with access to detailed real-time and historical meeting statistics.
Large Meeting Support (optional)	Supports video meetings including up to 100 two-way video participants.
Other Optional Services	BJN also offers: - Google Hangouts gateway - allows standards-based systems to connect to a Hangouts session - Salesforce.com integration – allows Salesforce users to schedule and launch BJN calls from within Salesforce.com - Primetime - a webcasting service integrated with the BJN video bridging service that supports large scale video events with audience participation

BJN does not support point-to-point video meetings. Instead, all BJN meetings are hosted on BJN video bridges and in BJN virtual meeting rooms (VMRs).

Strengths, Differentiators, and Features

Based on discussions with the company and our hands-on testing, WR has identified the following key differentiators / power features. Note that this is NOT intended to be an exhaustive list of all features, functions, and capabilities of this offering.

1) User and Administrator Preferences

While not obvious at first glance, BJN offers an almost dizzying array of user and administrator controls and settings that enable a truly customized workflow and experience. These settings can be defined on a per-user level or company-wide. Examples include:

User-based preferences / settings include:

- Change personal meeting ID (which is the VMR number)
- Change moderator password
- Change default connection option for invited attendees (e.g. set Lync as default)
- Change on-screen welcome message (e.g. "Welcome to the WR meeting room")
- Enable / disable audio alerts when people join or disconnect
- Define default video layout for meetings (e.g. all of my meetings use a 5+1 layout)

Additional settings include the ability to enable meetings without the host connected, enable / disable chat, allow only encrypted endpoints, enable auto recording, mute participants on entry, and make one or all meetings public (meaning they are included in the meeting listing on the user's BJN meeting page).

Admin-level preferences / settings include:

- Define domains (e.g. Wainhouse.com) for user accounts
- Select email invitation preferences (e.g.HTML with ICS, add to calendar link, text email, etc.)
- Enable / disable the sharing of video clips during meetings
- Enable / disable connection types (allow or disallow Lync and/or Jabber)
- Enable / disable meeting recording
- Define recording sharing preferences (e.g. can externals view a recording?)
- Define security requirements (e.g. configure SSO, define password requirements)

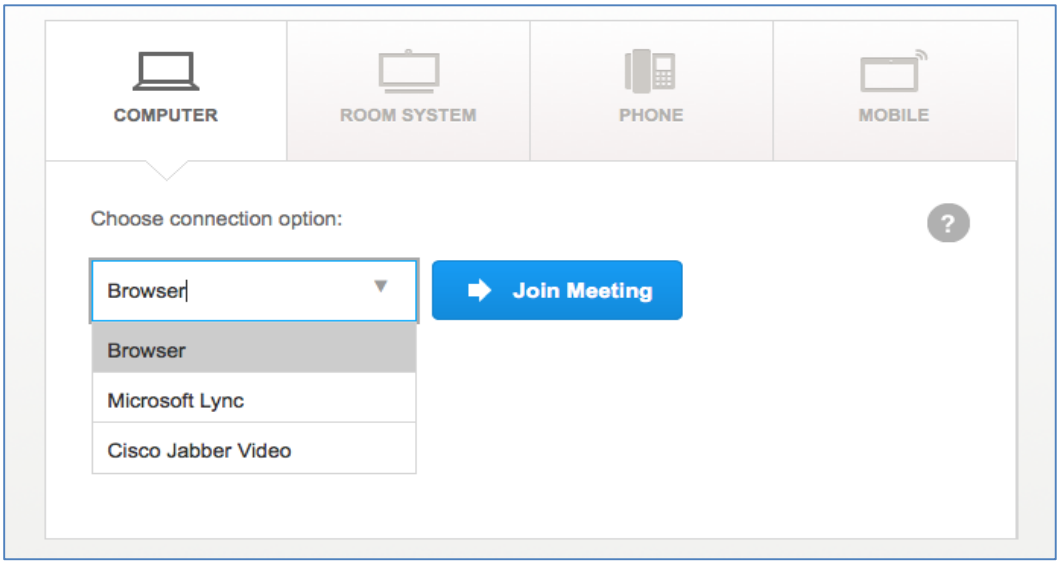
This level of user and administrator-level preference control is exceptional compared to competitors.

Hands-On Testing

The WR lab team tested many of the functions above and without exception all capabilities worked as advertised. However, the story here is not about an individual feature or function. The real value stems from the ability to create a truly personalized experience that suits your way of working. For example, some hosts are security conscious and therefore will appreciate the ability to accept only encrypted connections. Other hosts will appreciate the ability to disable alert tones as it protects the flow of the session. The ability to "have it your way" is extremely powerful.

2) Connection Wizard

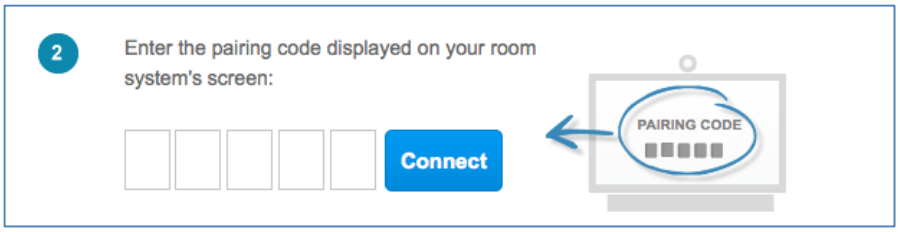
New and existing users will appreciate the BJN connection wizard; a web-UI that provides step-by-step instructions for connecting to BJN meetings. Depending on the connection method used (e.g. browser, Lync, etc.), the wizard may also provide a "click here to connect" URI (see screenshot below).



For connections from group video systems, the BJN connection wizard simplifies the connection process by allowing systems to join BJN meetings without using the IR remote and DTMF tones to enter the meeting room ID.[1] The workflow to connect a group video system to a BJN meeting is as follows:

1) Connect to the BJN service by dialing "bjn.vc" (or the IP address provided by the wizard)
2) Enter the 5-letter "pairing" code displayed on the group video system display into the BJN portal (see image below)

By entering the pairing code, BJN is able to identify the group video system and transfer the connection from the lobby to the proper VMR.



Note that the wizard is a layer on top of the other "advanced" connection options supported by BJN. For example, users can join BJN VMRs via the connection wizard, by entering the VMR's SIP URI into their preferred SIP client, or by clicking on the meeting link provided via IM by the meeting host.

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[1] Entering DTMF tones from a group video system is more complicated than it seems, requiring the user to activate "DTMF" mode on the video system using the IR remote. Worse still, the way to activate this mode varies by vendor (e.g. on Polycom systems, users must hold down the # key for a few seconds to activate this mode).

Hands-On Testing

The WR lab team tested the various ways of connecting to BJN meetings (via the connection wizard, by clicking on SIP URIs, etc.), and in almost all cases the results were as expected.

Web Browser - connecting from a web browser required the installation of a plug-in, even when using WebRTC-ready browsers like Chrome or Firefox. But after installing the plug-in, web browser connections were fast and easy, requiring only that the user click on the meeting URL.

Lync Connections - the workflow for connecting using Lync depends on the operating system in use. For Windows users, the wizard provides a "click here to join" link. Mac users, however, are presented with a copy button that allows them to copy and paste the Lync URI into the Lync client. Both methods worked well, but we obviously prefer the "click here to join" option available for Windows.

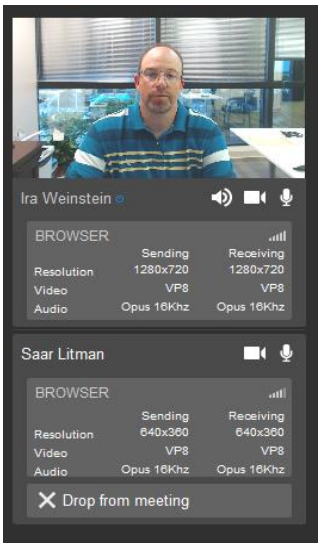
Jabber Connections - our testing revealed that the connect via Jabber option within the wizard simply provides a clickable SIP URI that once clicked opens the user's default SIP client, which may or may not be Jabber. Within the wizard, BJN provides a link to instructions for setting Jabber as your default SIP client. Despite this little nuance, clicking the URI worked as expected, allowing us to connect to our VMR with a single click.

Group Video Connections - as longstanding group video users, we really appreciated the pairing function. While initially this seemed like a foreign concept, we soon became accustomed – and eventually came to expect – this convenient way of avoiding the need to enter DTMF tones.

Mobile Users – those seeking to connect from their mobile device are presented a page offering two options: (1) join using the BJN mobile app, or (2) join with your phone as a telephone participant.

Overall, we expect that most users will find the connection wizard helpful. Novice, infrequent, and external users will appreciate the information and guidance the wizard provides. Advanced users, however, may find the wizard's workflow too cumbersome, opting instead to use direct dialing or cut and pasting of URIs. Fortunately, BJN supports both options.

3) Meeting Management



Unlike most completing bridging services, most of the connections to the BJN service – including browser-based, Lync-based, and group video connections - are associated with specific users. This capability is common among web conferencing and some audio conferencing services, but is typically lacking in video bridging services.

For example, in addition to the most common user commands (e.g. mute my audio, mute my video, change my on-screen layout, disconnect from the meeting), via the BJN portal BJN meeting hosts and participants can view the meeting participant list including names (not IP addresses or cryptic system names) and chat with other users.

In addition, meeting hosts can activate recording, disconnect other users, view meeting statistics (see image at right), change the default meeting layout, and more.

The key takeaway here is that the ability to identify connections by name enables a layer of user-specific meeting control not typically found in traditional video bridging services.

Hands-On Testing

The WR lab team tested the various meeting management functions and once again was pleased by the breadth of control provided by the BJN service. This is yet another reason to use BJN's web portal.

We were, however, disappointed that the BJN service does not allow telephone participants to identify themselves. In addition, we noted that once connected, a user could not identify himself to the service. Hopefully Blue Jeans will address these issues in the future.

4) Strong Interoperability

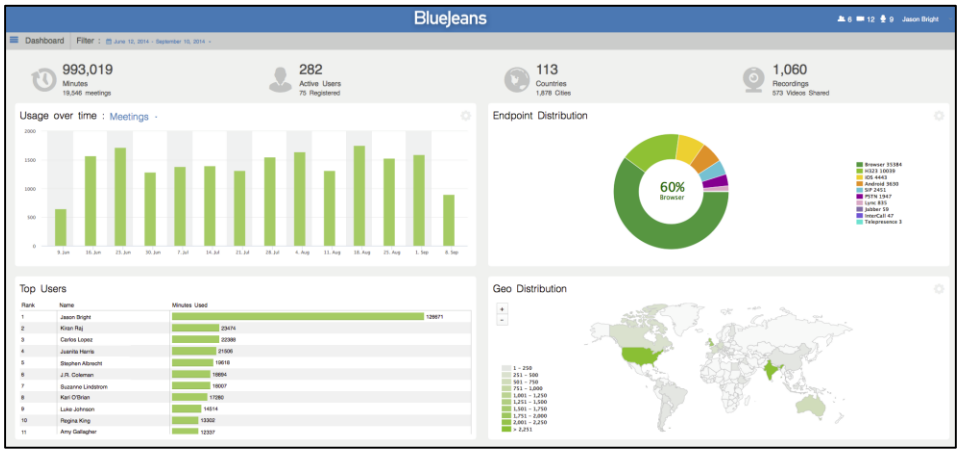
The BJN service supports a broad range of connections from various systems including SIP, H.323, numerous web-browsers, Lync, Google Hangouts, iOS and Android devices, and the telephone. While not unique at this point, this is clearly a power feature of the BJN service.

The WR lab team tested almost all of the above connection options and noted without exception that BJN provides a solid user experience – regardless of the device used.[2]

We also confirmed the ability to share content to and from between the various meeting participants. In all cases, content sharing performed as expected. BJN even supported content sharing to / from Lync (soon to be called Skype for Business) participants, and showed content within the stage of the Lync UI (and not in one of the video windows). As stated previously, BJN no longer supports Skype connections.

5) Command Center

In a word, the BJN Command Center is exceptional. Via Command Center, administrators gain access to real-time and historical information not available from competing video bridging services – or even customer premise video bridging solutions for that matter.



[2] WR did not test Google Hangouts interoperability as this requires a paid subscription to Google Apps for Business.

The Command Center offers three views:

- Dashboard – a top-level view of the company account on the BJN service including the total number of calls conducted on the service (total count and breakdown over time), breakdown of endpoint types used during BJN meetings, top users (in terms of call volume), and geographical breakdown of users, and more (see image above).

- Users – a searchable list of users including the number of meetings conducted and total number of participant minutes for each user. Clicking on a specific user's name provides access to a list of that user's past meetings and scheduled (future) meetings. Clicking on a specific meeting redirects the admin to information about that particular meeting in the meetings view.

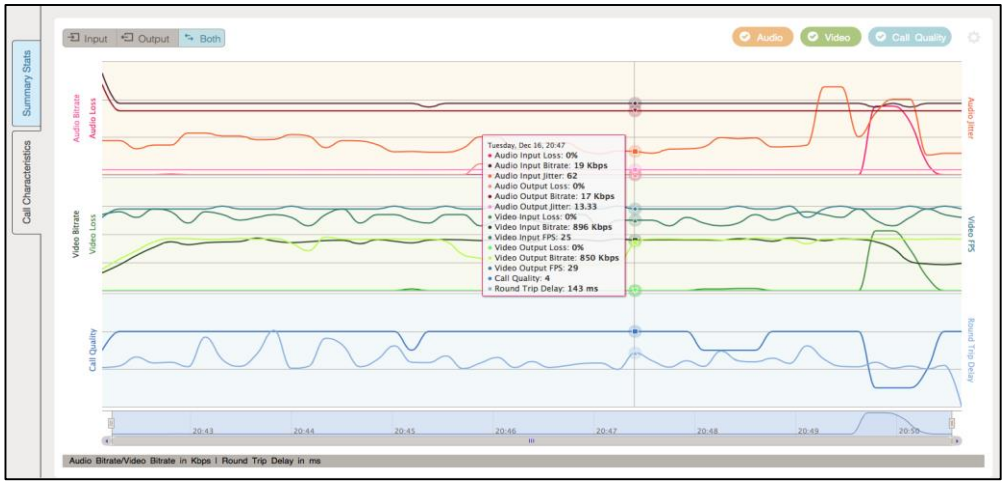
- Meetings – the meeting section is divided into two sub sections: All Meetings Stats (both past and current) and Live Meeting Stats. Each section shows a list of basic meeting details including meeting ID, moderator name, start time, end time, total number of participants, and duration.

  Each list also includes information about whether screen sharing was used, whether or not the meeting was recorded, whether a video clip was shared, and even if a survey was conducted during the session. These last few items are not commonly found in call detail records. While administrators can sort on key items, search is not currently supported.

  Clicking on a specific meeting brings the administrator to a meeting information page including three tabs; Stats, Audio/Video Timeline, and Geo distribution.

  - The "Stats" tab includes detailed information about that particular meeting including the above "basic" meeting information and a list of all participating endpoints. For each endpoint, the system displays the system name, IP address, location (based on IP address), join and leave time, encryption status, and key technical statistics including bitrate, jitter, loss, and frame rate.

    Clicking on a specific participating endpoint provides two additional tabs; Summary Stats and Call Characteristics (see image below).



The per-participant information provided by these tabs is beyond the scope of this document, but examples include:

- Details of the user's computer (e.g. a MacBook Air version 6,1 using an Intel CPU from CPU family 6 model 69 with a max CPU speed of 1300)
- Connection metrics (11 in total) captured every 10 seconds during the call (see red box in image above)
- A trace route between the endpoint and BJN service including ASN information (even we had to look this one up on Wikipedia)

- The "Audio/Video Timeline" tab provides a graphical view of the meeting on a per-user basis. Specifically, the timeline shows the following for each user / system:
  - When the user / system's audio was muted or unmuted
  - When the user / system started and stopped talking
  - When the user / system started and stopped sharing content
  - When the user / system experienced poor call quality (based on a call quality metric defined within the system by BJN)
- The Geo distribution shows a map highlighting the location of each connected endpoint.

Hands-On Testing

Despite having been briefed by Blue Jeans on this recently released capability, we didn't understand the real power of the Command Center until our hands-on testing.

The video conferencing industry has been plagued by a lack of easily accessible and understandable call statistics. Calls disconnect at random times. Video quality drops for no apparent reason. The list goes on and on. While true that some systems (e.g. group video endpoints and video bridges) provide some call statistics, a level of detail is typically lacking. In addition, those systems either do not store historical information, or store historical information in a cryptic, time-based log file.

Command Center changes the discussion in this area, making advanced meeting and system connection information available in a user-friendly format that even non-technical staff can understand and leverage within their troubleshooting efforts. While not designed for non-technical folks, any VC-savvy or IT-savvy person should be able to access and use the information to solve problems in real time.

Key Weaknesses

No product or service is 100% perfect. Below is a list of a few areas that could be improved.

Connection Quality – in general, all of our test calls provided acceptable video and audio quality. However, we did note that in some cases, the video resolution used was less than optimal given the systems in use and network conditions. For example, when connected with a web browser from our MacBook Air (Intel Core i5 processor with 10+ Mbps of Internet bandwidth), the maximum outgoing video resolution achieved was 640 x 360. With competing systems, this same notebook provided 720p or higher outgoing video. BJN is apparently working on this issue.

Similarly, while connecting with a web browser from our Windows 7 test system (Intel Core i7), we noted that the call quality would increase and decrease significantly without any apparent reason. During one test call, the resolution increased 6-fold from 512 x 288 to 720p and then back again.

NAT / Firewall Traversal – while not specifically related to BJN, the lack of NAT / firewall traversal support means that those seeking to connect standards-based video systems / clients must address their firewall issues on their own. Fortunately, NAT / firewall traversal is included in BJN's browser plug-ins and mobile apps.

Limited Network Options – currently the BJN service is hosted and accessible via the Internet only. As a result, ALL call traffic must leave the customer's network and make its way to BJN's hosted video bridges. This is the same traditional approach used by hosted video bridging providers for decades.

Recognizing the importance of efficient bandwidth management, some next-generation providers support hybrid approaches that leverage on premise equipment combined with hosted platforms. With this methodology, "internal" call traffic remains on the customer's network / behind the customer's firewall, while external connections leverage the provider's hosted technology. In some cases, calls co-reside on both internal and external servers. The result is improved call quality and reliability, while simultaneously minimizing external bandwidth consumption.

In addition, BJN does not currently support dedicated links between customer's networks and the BJN service. Therefore, all calls must traverse the public Internet and cannot be protected by QoS.

WR would not be surprised to see BJN offer a CPE video bridge, direct network peering, and some type of assistance for firewall traversal in the future.

Command Center Suggestion – while we stand in awe of Command Center in many ways and understand that Command Center is a new offering, the system does not currently provide the admin with a view of all meetings that included a specific endpoint. This minor addition would allow administrators to discover and resolve ongoing issues with specific systems or locations.

CONCLUSION

Despite our natural propensity to be overly critical, we were hard pressed to find significant weaknesses or poorly implemented features within the Blue Jeans Network video bridging service.

Simply stated – the BJN service works very well. The user interface is well designed and aesthetically pleasing, and the system provides an exceptionally wide range of user customizable functions and features. Although the call experience is basically on-par with competing video bridging services, the administration tools are best of breed for video bridging service provider – and even on premise solutions.

Our deep dive into the BJN service revealed a number of interesting items. For example, the BJN connection wizard highlights a subtle but important difference between BJN and other video bridging services in that BJN not only supports connections from a web browser … BJN wants people to connect via the web browser.

Even when using a group video system, BJN wants meeting attendees (or at least the local meeting host) to be logged into the BJN web portal to manage the meeting. This is a next-generation user paradigm that other providers are just now starting to pursue. BJN, however, was an early player in this area.

We also noted that despite BJN's well-deserved reputation for strong interoperability, the company's real strength lies in its ease of use and advanced web portal. While interop may attract IT managers and video-gurus to the service, it is the sexy UI and strong workflow that keeps users coming back to BJN.

Overall, and despite a few minor weaknesses, the WR lab gives the Blue Jeans Network hosted video bridging service a rousing thumbs-up.

About the Authors

Ira M. Weinstein is a Senior Analyst & Partner at Wainhouse Research and a 20-year veteran of the conferencing, collaboration and audio-visual industries. Ira has authored and contributed to dozens of articles, white papers, studies, reports, and evaluations on rich media communications, video conferencing, streaming and webcasting, audio-visual design and integration, business strategy, and general business practices. Ira specializes in providing strategic advisory services to vendors, resellers, and end-users within the collaboration space. Ira can be reached at iweinstein@wainhouse.com.

Saar Litman is a Senior Researcher & Consultant at Wainhouse Research and has 15 years' of experience in the audio-visual and video conferencing industry. Saar's primary focus is the products, services, and companies within the audio-visual space. In addition, Saar provides AV design services, helps enterprise organizations define and implement global AV standard systems and designs, and manages the WR test lab in Coral Springs, Florida. Saar can be reached at slitman@wainhouse.com.

About Wainhouse Research

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.

About Blue Jeans Network

(Copy provided by Blue Jeans Network)

Blue Jeans Network aims to bring great minds together to meet, share ideas and reach their audience through the power of video collaboration. By making video communication easy, secure and scalable, Blue Jeans customers can make online conversations, meetings and events personal again. Blue Jeans' cloud-based platform has taken video into the mainstream, giving business and thought leaders the power to interact face-to-face with anyone, anywhere. Blue Jeans Network is a private company headquartered in Mountain View, CA. For more information, visit bluejeans.com or follow the company @BlueJeansNet.

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