Pexip Infinity version 14
Specifications and Requirements

The Pexip Infinity platform is designed to use industry-standard servers from any vendor to provide high-quality, scalable and efficient conferencing. The following tables cover the platform, Infinity Connect, audio and video, host hardware, capacity and hypervisor specifications and requirements.

Pexip Infinity platform

Feature	Description
Application deployment and management	• Software-based, virtualized application architecture, running on industry-standard servers. • Management using industry-standard tools, including VMware vSphere, Microsoft Hyper-V, KVM and Xen, and the ability to deploy onto generic hypervisors and orchestration layers. • Ability to deploy on Amazon Web Services (AWS) and Microsoft Azure cloud platforms, including dynamic bursting into the AWS cloud when primary conferencing capabilities are reaching their capacity limits. • Flexible deployment model allowing customers to deploy the platform in the way that is most appropriate for them without needing to consume additional software licenses or purchase dedicated hardware. • Ability to seamlessly increase capacity by deploying new, updated, or additional hardware resources. • Management API supporting configuration, status reporting and call control. • Support for Russian and Chinese language in the Pexip Infinity Administrator interface.
Distributed architecture	• Efficient distribution to reduce bandwidth consumption over expensive WANs. • Industry-leading resilience and redundancy capabilities. • A flexible licensing model that allows you to pool conference resources and quickly increase capacity in response to current local requirements. • Able to overflow capacity between nodes and locations, providing support for conferences that span multiple physical boxes. • Keeps media as local to each endpoint as possible, reducing the negative impacts of latency, jitter, and packet loss commonly experienced on centralized deployments.
Intelligent conference management	• Upscaling all connected participants to provide a seamless experience to all. • Ability to respond dynamically to fluctuating network conditions by downspeeding and upspeeding individual participants, and support for endpoint-based packet loss recovery and adaptation methodologies (such as packet loss concealment and dynamically adapting bandwidth), thereby protecting the user experience in the event of information loss. • Bandwidth-optimized content sharing towards Infinity Connect clients for crisp image at low bandwidth. • Full support for individual transcoding and transrating of both main stream video and audio, and dual stream content. • Simple conference management and interaction for conference participants using Infinity Connect clients, including the ability for Host participants to add, disconnect, mute and unmute other participants. • Advanced conference management and interaction for administrators (using the web-based Administrator interface or the management API). • Optional tagging of services to allow service providers to track VMR use in CDRs and logs.

Feature	Description

Conferencing services	• **Virtual Meeting Rooms** providing personal meeting spaces for everyone within the organization.
	• **Virtual Auditoriums** designed to hold larger lecture-style conferences.
	• **Virtual Reception** IVR (Interactive Voice Response) service.
	• **Pexip Distributed Gateway** enables endpoints to make point-to-point calls to other endpoints that use different protocols and media formats (e.g. from Lync / Skype for Business or WebRTC to H.323). Includes DTMF support.
	• VMRs and devices can be bulk-provisioned from directory information contained in a Windows Active Directory LDAP server, or any other LDAP-accessible database.
	• Choice of layouts: main speaker only; main speaker + 7 video thumbnails; main speaker + 21 video thumbnails; or 2 main speakers + 21 video thumbnails .
	• Conference participants can chat and share messaging content.
	• Can output a dedicated multimedia stream to enterprise CDN (Content Delivery Network) streaming and recording services such as Wowza, Adobe, VBrick, Abiliteam, Qumu and Azure Media Services, and to public streaming services such as YouTube.
	• Ability to manage conferences and participants:
	  ○ PIN-protect conferences and differentiate between Hosts and Guests.
	  ○ Lock a conference to prevent any further participants from joining.
	  ○ Transfer a participant to another conference.
	  ○ Limit the number of participants in a conference, on a per-conference basis.
	  ○ Limit the bandwidth used by each participant, on a per-conference and/or global basis.
	• Ability to re-brand with your own images and voice prompts, on a per-conference basis.
	• Ability to re-brand the Infinity Connect experience.
	• Ability to integrate Infinity Connect (WebRTC/RTMP) functionality with third-party applications and websites via a front-end SDK.
	• Call policy decisions can be taken by an external system or a local policy script.
	• Test call service that allows users to check their connectivity and the quality of their video and audio.

Broad interoperability and protocol support	• Full support for existing industry-standard protocols (SIP, H.323), as well as other technologies (HTML5, Microsoft Lync, Skype for Business, RTMP, WebRTC, ORTC). • Ability to enable and disable support for individual audio and video codecs. • Easy integration with existing SIP and H.323 call control solutions including Cisco UCM, Cisco VCS, Polycom CMA, Polycom DMA, Avaya Aura, Microsoft Lync 2010 and 2013, Skype for Business and others. • Conferencing Nodes can act as SIP registrars and as H.323 gatekeepers. • Support for automatic call escalation using Multiway (Cisco VCS), call transfer capability (Cisco UCM), and CCCP to a Microsoft Lync / Skype for Business meeting. • Support for presence and customizable avatar published to a Microsoft Lync / Skype for Business client. • Support for automatic dial-out to audio bridges, including automatically issuing conference aliases and pass codes via DTMF tone generation. • IPv4 and IPv6 support. • Ability to tag management, call signaling, and media packets independently with DSCP QoS support. • Support for Forward Error Correction (FEC), downspeeding, bandwidth throttling, and other packet loss concealment technologies.
Firewall traversal	• Support for static NAT. • Support for static routes. • Conferencing Nodes can be deployed with dual network interfaces. • Support for far-end NAT traversal (media latching). • Support for media over a TCP connection to assist with firewall traversal.

Feature	Description
Security and monitoring	• Designed to comply with US Federal security requirements. • TLS certificate management, HSTS, certificate signing requests (CSRs). • DTLS support. • Active Directory / LDAP integration for administrator account authentication and authorization. • SNMPv2c and SNMPv3 support. • Support for multiple roles of access. • Authenticated SIP trunks. • Limit Pexip Distributed Gateway calls to registered devices only.

Pexip Infinity Connect

Pexip Infinity Connect is a suite of free client software allowing users to connect to Pexip Infinity services from a web browser, installable desktop client, or mobile device.

Feature	Description
Standard features for all Infinity Connect clients	• Can be used to join conferences as a full audio/video participant, an audio-only participant, or as a presentation and control only participant. • Can be used to make point-to-point calls in conjunction with the Pexip Distributed Gateway. • Provides conference control to Host participants. • Allows participants to share and view content, whether or not they are connected with video and/or audio. Supported formats are JPEG, BMP, PNG, GIF and PDF. • Infinity Connect via Chrome and Infinity Connect desktop client users can share their screen in addition to sharing images and PDFs. • Chat (Instant Messaging) support. • Supports sending of DTMF tones. • Access to this feature can be administratively disabled.
Infinity Connect Web App	• Allows participants to join a Virtual Meeting Room or Virtual Auditorium, or make a call via the Pexip Distributed Gateway, using a web browser as their video endpoint. Supported in: • Google Chrome version 43 and later • Mozilla Firefox version 39 and later • Opera version 23 and later • Microsoft Internet Explorer version 10 and later (requires Flash Player 11 and later ActiveX® plug-in, and must not be in Compatibility View) — note that support for Internet Explorer on Windows 10 systems has been deprecated • Microsoft Edge version 20.10532 or later for WebRTC support (earlier versions will connect over RTMP and use Flash video) • Apple Safari version 6 and later (Mac OS X only) (requires Flash Player 11 and later plug-in)
Infinity Connect desktop client	• Allows a participant to join a Virtual Meeting Room or Virtual Auditorium, or make a call via the Pexip Distributed Gateway, using a lightweight client on any PC with any operating system. • Allows users to register their clients in order to receive incoming calls. Supported on: • Microsoft Windows 7 and later • Mac OS X 10.7 and later • Ubuntu Linux

Feature	Description
Infinity Connect Mobile client	• Allows a participant to join a Virtual Meeting Room or Virtual Auditorium, or make a call via the Pexip Distributed Gateway, using a client downloaded onto their mobile device. • Enables participants to view presentations on their mobile device, regardless of whether they are a video, audio-only, or control-only participant. • Users can register their device in order to receive incoming calls. Available versions: • Infinity Connect Mobile client for iOS • Infinity Connect Mobile client for Android

Audio and video specifications

Feature	Description
Supported protocols	• H.323 • SIP • WebRTC • RTMP • Microsoft Lync / Skype for Business • Individual protocols can be administratively enabled and disabled.
Audio codecs	• G.711(a/μ) • G.719 (this product is covered by patent rights licensed from Telefonaktiebolaget LM Ericsson) • G.722 • G.722.1, G.722.1 Annex C (licensed from Polycom®) • Siren7™, Siren14™ (licensed from Polycom®) • G.729, G.729A, G.729B • Opus • SILK • MPEG-4 AAC-LD (MPEG-4 video technology licensed by Fraunhofer IIS) • Speex • AAC-LC
Video codecs	• H.261 • H.263, H.263++ • H.264 (Constrained Baseline Profile, Baseline Profile and High Profile), H.264 SVC (UCIF Profiles 0, 1) • VP8 • VP9 (technology preview only) • Flash video (for Internet Explorer and Safari browser support) • RTVideo (licensed from Microsoft®).
Content sharing	• H.239 (for H.323) • BFCP (for SIP) • RDP (for Microsoft Lync / Skype for Business) • VbSS (for Skype for Business) (technology preview only) • PSOM (for presenting PowerPoint files from Microsoft Lync / Skype for Business clients) • VP8 (for WebRTC high framerate) • JPEG (for apps and web).

Feature	Description
Bandwidth	• Connections from 8 kbps per participant (G.729, audio-only), up to 6 Mbps per participant (will vary depending on the deployment environment, video resolutions, etc).
Other audio and video features	• Resolutions from QCIF to Full HD 1080p (1920 x 1080); 4:3 and 16:9 aspect ratios. • Frame rates up to 30 fps. • Customizable video watermarking. • Pexip StudioSound™ for recording-studio audio quality. • Wideband audio mixing. • Automatic gain control. • Control individual audio via Infinity Connect clients. • Support for AES (128-bit key size), DTLS SRTP, and H.235 for H.323 media encryption.

Host hardware requirements

Feature	Description
CPU	**Conferencing Nodes** • We recommend Intel Xeon E5-2600 series (Haswell architecture) or similar Xeon processors from 2012 or later, 2.3 GHz or faster. • We recommend 10-12 physical cores per socket. **Management Node** • Any processor, 2.0 GHz or faster. • 2 cores.
RAM	**Conferencing Nodes** 1 GB RAM per vCPU, so either: • 1 GB RAM per physical core (if deploying 1 vCPU per core), or • 2 GB RAM per physical core (if using hyperthreading and NUMA affinity to deploy 2 vCPUs per core). **Management Node** • Minimum 4 GB RAM for the Management Node.
Storage	**Conferencing Nodes** • 50 GB minimum per Conferencing Node • 500 GB total per server (to allow for snapshots etc.) **Management Node** • 100 GB SSD
GPU	• Host servers do not require any specific hardware cards or GPUs.
OS	• The Pexip Infinity VMs are delivered as VM images (.ova etc.) to be run directly on the hypervisor. No OS should be installed.
Network	• Gigabit Ethernet connectivity is strongly recommended. • In general, you can expect 0.5-3 Mbps per call, depending on call control setup.
Multiple VMs sharing the same hardware	• Pexip Infinity Conferencing Nodes and Management Nodes may share the same physical host. • Pexip nodes may also share the same physical host with other virtual machines. • Pexip virtual machines must be configured with dedicated CPU and memory resources, i.e. Pexip virtual machines do not support oversubscription.

Feature	Description
Service provider considerations	A Pexip deployment can manage multiple customers in various ways: • **Single Management Node, multiple domains, shared Conferencing Nodes** A single installation with one Management Node and one or more Conferencing Nodes is used by all customers. Call control or DNS sends calls for all domains to the shared Conferencing Nodes. Does not provide dedicated capacity per customer. • **Single Management Node, multiple domains, dedicated Conferencing Nodes** One or more Conferencing Nodes per customer. Allows for dedicated capacity per customer. • **Dedicated Management Node and dedicated Conferencing Nodes per customer instance** Allows for close customer network integration, using VLANs, hosted on a shared server farm with multiple VLANs. The dedicated Management Node allows for customer self-management.

Capacity

Feature	Description
Call capacity	Capacity is dependent on server specifications. As a general indication, using our recommended hardware (Intel Haswell, 10 cores, 2.3 GHz) Pexip Infinity can connect: • up to two High Definition 720p30 calls per CPU core (based on 1.1 GHz per call plus 20% headroom) • up to 20 audio-only AAC-LD calls at 64 kbps. Servers that are older, have slower processors, or have fewer CPUs, will have a lower overall capacity.

Hypervisor requirements

Feature	Description
VMware	• Version 14 of the Pexip Infinity platform supports VMware vSphere ESXi 5.x and 6.0, although we recommend ESXi 5.5 or 6.0. Support for ESXi 4.1 is being deprecated - if you have upgraded from a version prior to v12, you can still deploy Conferencing Nodes to servers running ESXi 4.1; however if you have a new deployment using v12 or later and attempt to deploy a Conferencing Node to a server running ESXi 4.1, that node will go straight into maintenance mode. • We recommend at least the **Standard** edition. • The **Enterprise** and **Enterprise Plus** editions have additional features that can be taken advantage of by Pexip Infinity in larger deployments. • The Pexip Infinity platform will run on the **free edition** of vSphere Hypervisor. However, this edition has a number of limitations that mean we do not recommend its use except in smaller deployments, or test or demo environments. Notably, automatic deployment of Conferencing Nodes is not supported.
Microsoft Hyper-V	• The Pexip Infinity platform supports Microsoft Hyper-V in the form of Microsoft Hyper-V Server 2012 and later, and Windows Server 2012 and later.
KVM	• Pexip Infinity requires your KVM environment to include Linux kernel 3.10.0 or later, and QEMU 1.5.0 or later. This means the following distributions: Debian 8, RHEL 7, SLES 12, or Ubuntu 14.04 (or later, where appropriate).
Xen	• Pexip Infinity requires Xen 4.2 and later.
Other hypervisors and orchestration layers	• Conferencing Nodes can be provisioned with a configuration document generated independently of a generic VM image. This permits deployment of Pexip Infinity onto unsupported hypervisors as well as onto supported hypervisors that are managed by an orchestration layer. • Pexip Infinity can be deployed on Amazon Web Services (AWS). • Pexip Infinity can be deployed on Microsoft Azure. • Pexip Infinity can be deployed on the HPE Helion Openstack® Cloud platform.