



# BeyondTrust

## **Privileged Remote Access Security in Cloud Whitepaper**

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# Security in BeyondTrust Privileged Remote Access (Cloud)



*Note: Public. For Information Purposes Only.*

The purpose of this document is to help you, a technically-oriented professional, understand the security-related value BeyondTrust Privileged Remote Access (PRA) brings to your organization. PRA helps your organization stay secure and compliant, while improving the efficiency and success of your organization with a better user experience.

## Get to Know BeyondTrust Privileged Remote Access: An Overview

BeyondTrust connects and protects people and technology with leading secure access solutions that strengthen security while increasing productivity. Privileged Remote Access (PRA) lets you control access to critical systems without hindering the work privileged users need to perform. You can define how users connect, monitor sessions in real time, and record every session for a detailed audit trail.

PRA can connect to external user directories, such as LDAP, for secure user management, and natively integrates with leading systems management and identity management solutions. An API is provided for use with automation tools and external applications.

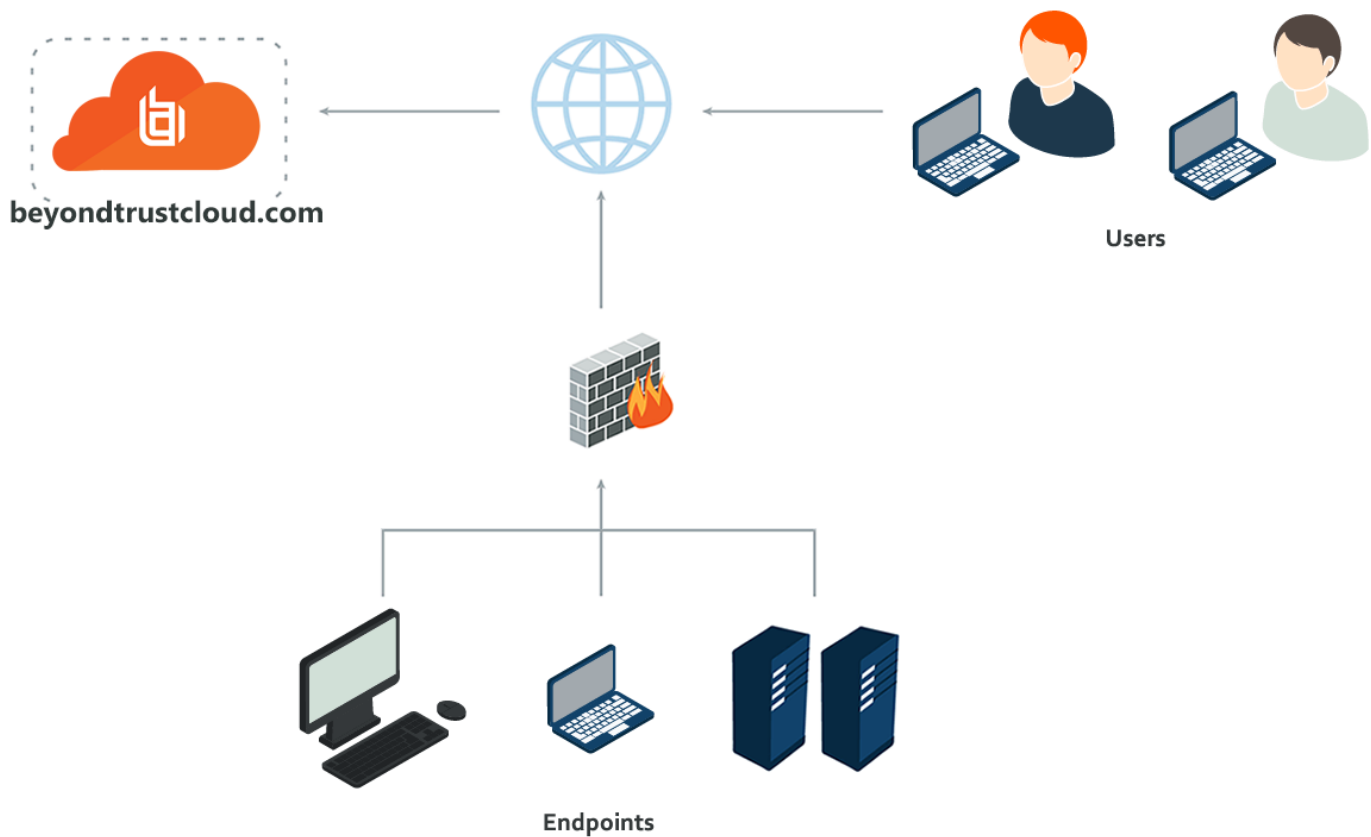
Secure remote access through PRA is compatible with multiple operating systems, including Windows, Mac, various Linux distributions, and mobile operating systems. Supported system types include laptops, desktops, servers, kiosks, point-of-sale systems, smartphones, and network devices.

PRA mediates connections between users and remote systems, allowing file uploads and downloads, remote control of desktops, and access to system information and diagnostics, the command line, and the registry editor.

# Understand the Architecture of BeyondTrust Privileged Remote Access (Cloud)

## Infrastructure

The BeyondTrust Privileged Remote Access (PRA) Cloud infrastructure is spread across six Tier 3 or higher data centers. PRA customers can designate a regional data center to host their PRA solution so that performance is not hindered by geographic distance between users of the solution. All data centers leverage advanced electrical and cooling systems and N+1 redundancy with uninterruptable power solutions and generator backup. The data centers have advanced networking capabilities such as 10Gb+ connectivity and a 40Gb+ core network.



## Compliance

Data centers hosting the Privileged Remote Access (PRA) Cloud have achieved ISO/IEC 27001 certification of their information security management systems. Additionally, all data centers have completed the following examinations:

- SOC II Type 1
- SSAE 16
  - SOC 1 Type II
  - SOC 2 Type II

They are also Privacy Shield certified to meet European Data Privacy compliance regulations.

## Physical Security

All PRA servers are housed in data centers that employ a high standard of physical protection. The measures include multiple levels of physical security, such as:

- Man traps / air lock
- Badged access
- Securely locked cages
- Biometric access
- Securely isolated storage area
- 24/7 security personnel on duty

## Network Security

The network architecture is built to protect all entry points assigned to customers. Highly available edge gateways and segmented network components are dedicated and configured in PRA. The infrastructure is continuously monitored, and vulnerability testing is conducted regularly by internal security staff.

## Customer Data

All customer data is confined to a dedicated instance of PRA allocated to your organization. The data physically and logically resides in a siloed PRA instance and is not shared between customers. This unique approach to the segregation of customers keeps your data safe.

## Authenticate to BeyondTrust Privileged Remote Access (Cloud)

BeyondTrust Privileged Remote Access can be provisioned for locally defined PRA user accounts or can be integrated into existing authentication sources. For instance, a commonly integrated authentication source is Microsoft Active Directory. When using a directory such as this, all authentication follows the existing controls and processes in place for safeguarding user accounts.

Additional security providers are available that allow for user authentication using Kerberos or SAML (for single sign-on) or using RADIUS (for multi-factor authentication). Each of these providers can be configured to use LDAP groups to set the permissions for the user, allowing you to map existing LDAP groups to teams in BeyondTrust.

There are a large number of granular permissions that can be granted to users. These permissions determine which features in PRA a user has access to.

# Manage Credentials in BeyondTrust Privileged Remote Access (Cloud)

BeyondTrust Privileged Remote Access (PRA) can be integrated with an Endpoint Credential Manager (ECM) to improve password security for privileged users and vendors.

An ECM functions as the middleware for communication, and the ECM can be used to integrate PRA with password vaults.

Credential injection is a built-in feature of PRA. It allows administrators and privileged users to seamlessly inject credentials into systems without exposing plain text passwords, and this feature can also be used with third-party vault tools.

## Credential Management with BeyondTrust Vault

BeyondTrust Vault is a credential store that exists on the B Series Appliance, enabling discovery of and access to privileged credentials. You can manually add privileged credentials, or you can use the built-in discovery tool to scan and import Active Directory and local accounts into BeyondTrust Vault.

BeyondTrust Vault fits seamlessly with service desk workflow because it is integrated directly with the Privileged Remote Access solution. Technicians do not have to learn to use another tool or even exit BeyondTrust to retrieve passwords. With just one click in the BeyondTrust representative console, users can simply select the correct credential from the dropdown and log directly into a remote system - without ever having to know or even see the actual password.

## Frequently Asked Questions about BeyondTrust Vault

### What Communication Pathways Are Used With BeyondTrust Vault (Ports, Protocols, Connection Types, etc.)?

- **Active Directory and Discovery:**

- By default, discovery occurs over LDAP via the Active Directory Service Interface (ADSI) on port 389.
- If LDAPS is enabled, Active Directory queries run over LDAP under an SSL/TLS layer on port 636, unless another port is specified. This transport-layer security encrypts all data communicated to and from Active Directory.

- **Windows Local Discovery:**

- Local Windows accounts are discovered via a series of calls directly to Windows APIs.
- These APIs use Remote Procedure Calls (RPCs) and named pipes as the network protocol.
- The RPC process translates the request parameters as well as any response data into a standard, encoded format for transmission.
- Protection is negotiated at the operating system level.

## Where Does Encryption for BeyondTrust Vault Occur?

- Passwords and private SSH keys are encrypted at rest using AES-256-GCM in addition to any full disk encryption enabled for the B Series Appliance.
- Passwords and private SSH keys are encrypted in transit using an ephemeral public+private key pair when used for injection. This encryption occurs in addition to Privileged Remote Access's use of TLS to encrypt communication among all BeyondTrust components, such as the B Series Appliance, Jumpoint, customer client, etc.
- Passwords are encrypted in transit by TLS.
- Passwords used by Jumpoints to authenticate with Active Directory are never sent in plaintext to Active Directory.

## Where Is the Vault Encryption Key Stored? Can It Be Accessed via /login or /appliance?

- The Vault encryption key is needed to decrypt credentials managed by BeyondTrust Vault. This key is stored in one of the credential stores configured on the appliance.
- The encryption key can be backed up by going to **/login > Management > Software Management > Backup Vault Encryption Key**. The backup file format used for the encryption key is the same NSB file format used for configuration and reporting data.

## Is the BeyondTrust Application Database Encrypted, and if So, How?

- BeyondTrust Vault stores data in an encrypted format in the database. If full disk encryption is enabled for your B Series Appliance, the BeyondTrust application database is also encrypted. However, this is independent of the encryption performed by BeyondTrust Vault.

## What Best Practices Are Recommended to Maintain the Highest Level of Security Across All Points of Connection (Discovery, Injections, Support, etc.)?

- BeyondTrust recommends using a valid CA-signed SSL certificate to protect communication among all BeyondTrust components.
- Jumpoints should run on a system only a few privileged users have permissions to access.



For more information about Jumpoints, please see [Privileged Remote Access Jumpoint Guide: Unattended Access to Computers in a Network](https://www.beyondtrust.com/docs/privileged-remote-access/how-to/jumpoint/index.htm) at <https://www.beyondtrust.com/docs/privileged-remote-access/how-to/jumpoint/index.htm>.



**Note:** There are no user-visible security settings for BeyondTrust Vault.



# Ensure Encryption and Ports in BeyondTrust Privileged Remote Access (Cloud)

BeyondTrust Privileged Remote Access (PRA) can be configured such that it enforces the use of SSL for every connection made to the site. PRA requires that the SSL certificate being used to encrypt the transport is valid.

PRA can natively generate certificate signing requests. Configuration options also are available to disable the use of TLSv1 and/or TLSv1.1. PRA always has TLSv1.2 enabled to ensure proper operation of the software. Available cipher suites can be enabled or disabled and reordered as needed to meet the needs of your organization.

The PRA software itself is uniquely built for each customer. As part of the build, an encrypted license file is generated that contains the site Domain Name System (DNS) name and the SSL certificate, which is used by the respective PRA client to validate the connection that is made to the Cloud site.

The chart below highlights the required ports and the optional ports. Note that there is very minimal port exposure of the PRA Cloud infrastructure. This drastically reduces the potential exposed attack surface of the site.

Below are example firewall rules for use with Privileged Remote Access Cloud, including port numbers, descriptions, and required rules.

| Firewall Rules                                    |   |
|---|---|
| <b>Internal Network to the PRA Cloud Instance</b> |   |
| TCP Port 443 (required)*                          | Used for all session traffic.   |
| <b>PRA Cloud Instance to the Internal Network</b> |   |
| TCP Port 25, 465, or 587 (optional)               | Allows the B Series Appliance to send admin mail alerts. The port is set in SMTP configuration. |
| TCP Port 443 (optional)                           | B Series Appliance to web services for outbound events.   |

## Audit BeyondTrust Privileged Remote Access (Cloud)

BeyondTrust Privileged Remote Access (PRA) provides two types of session logging. All the events of an individual session are logged as a text-based log. This log includes users involved, session tools used, chat transcripts, system information, and any other actions taken by the PRA user. This data is available on the B Series Appliance in an uneditable format for up to 90 days, but it can be moved to an external database using the BeyondTrust API or the BeyondTrust Integration Client (IC). All sessions are assigned a unique session ID referred to as an LSID. The session LSID is a 32-character string that is a unique GUID for each session. The LSID is stored as part of each session log for every session conducted.

PRA also allows enabling video session recordings. This records the visible user interface of the endpoint screen for the entire screen sharing session. The recording also contains metadata to identify who is in control of the mouse and keyboard at any given time during the playback of the recorded session. The period of time these recordings remain available depends on the amount of session activity and the available storage, up to 90 days maximum. As with the session logging, these recordings can be moved to an external file store using the API or the IC.

The IC can be used to export data from the site and store it if needed to comply with security policies. PRA can also be configured to store data for a shorter period of time to help comply with security policies.

The IC is a Windows application that uses the API to export session logs, recordings, and backups from the PRA Cloud site according to a defined periodic schedule. The IC uses plug-in modules to determine the repository for the exported data.

BeyondTrust provides two IC plug-in modules. One handles export of reports and video recordings to a file system destination. The second exports select report information (a subset of the entire data collection) to a Microsoft SQL Server database. Setup of the IC for SQL Server includes all of the procedures needed to automatically define the necessary database, tables, and fields.

In practice, the IC is used to export session data that must be retained for legal and compliance reasons. The reports and recordings are archived in a file system, indexed by session IDs. Data stored in the SQL Server tables can be queried to locate the PRA session ID corresponding to given search criteria such as date, user, or IP address.

All authentication events, such as when a user logs into the access console or accesses the /login interface, generate a syslog event which can be logged on a syslog server. Additionally, any configuration change that is made to the PRA Cloud instance also generates a syslog event showing the change that was made and by which user.

## Validate BeyondTrust Privileged Remote Access (Cloud)

To ensure the security and value of our product, BeyondTrust incorporates vulnerability scanning in our software testing process. We track the results of vulnerability scans performed prior to a software release and prioritize resolution based on severity and criticality of any issues uncovered. In the event a critical or high-risk vulnerability surfaces after a software release, a subsequent maintenance release addresses the vulnerability. Updated maintenance versions are distributed to our customers via the update manager interface within the Privileged Remote Access (PRA) administrative interface. When necessary, BeyondTrust Support contacts customers directly, describing special procedures to follow to obtain an updated maintenance version. Additionally, PRA Cloud instances can be automatically updated based on the update interval chosen by the customer at the time of purchase.

In addition to internal scanning procedures, BeyondTrust contracts with third-parties for a source code level review as well as penetration testing. The source code review conducted essentially provides validation from a third party that coding best practices are followed and that proper controls are in place to protect against known vulnerabilities. A penetration test is conducted to confirm the findings.