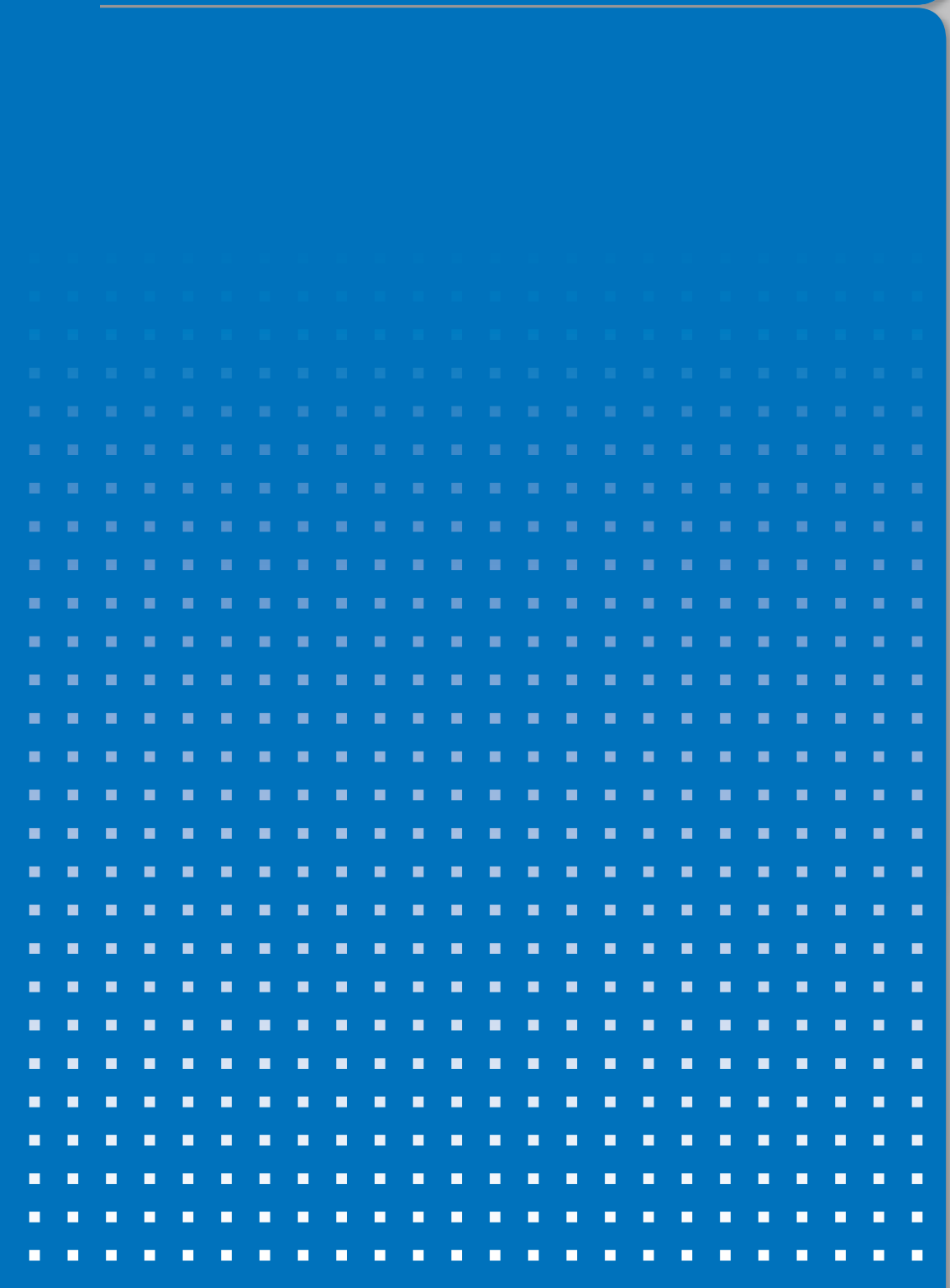
Kaseya White Paper

Seconds Matter:
Resolve Issues Quickly with the World's Fastest Remote Desktop Management



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As an IT professional, you know that when you have many users to support, every second counts! Slow remote desktop connection times and poor, unreliable connection performance can add up to significant time wasted when extended over days, weeks and months of remote control sessions. When a remote control session is required, you need to know that your connection can be established rapidly and reliably with just the click of a button. Your remote connection speed and reliability are critical to your ability to resolve issues quickly, maximizing IT efficiency and ensuring a happy and productive end user.

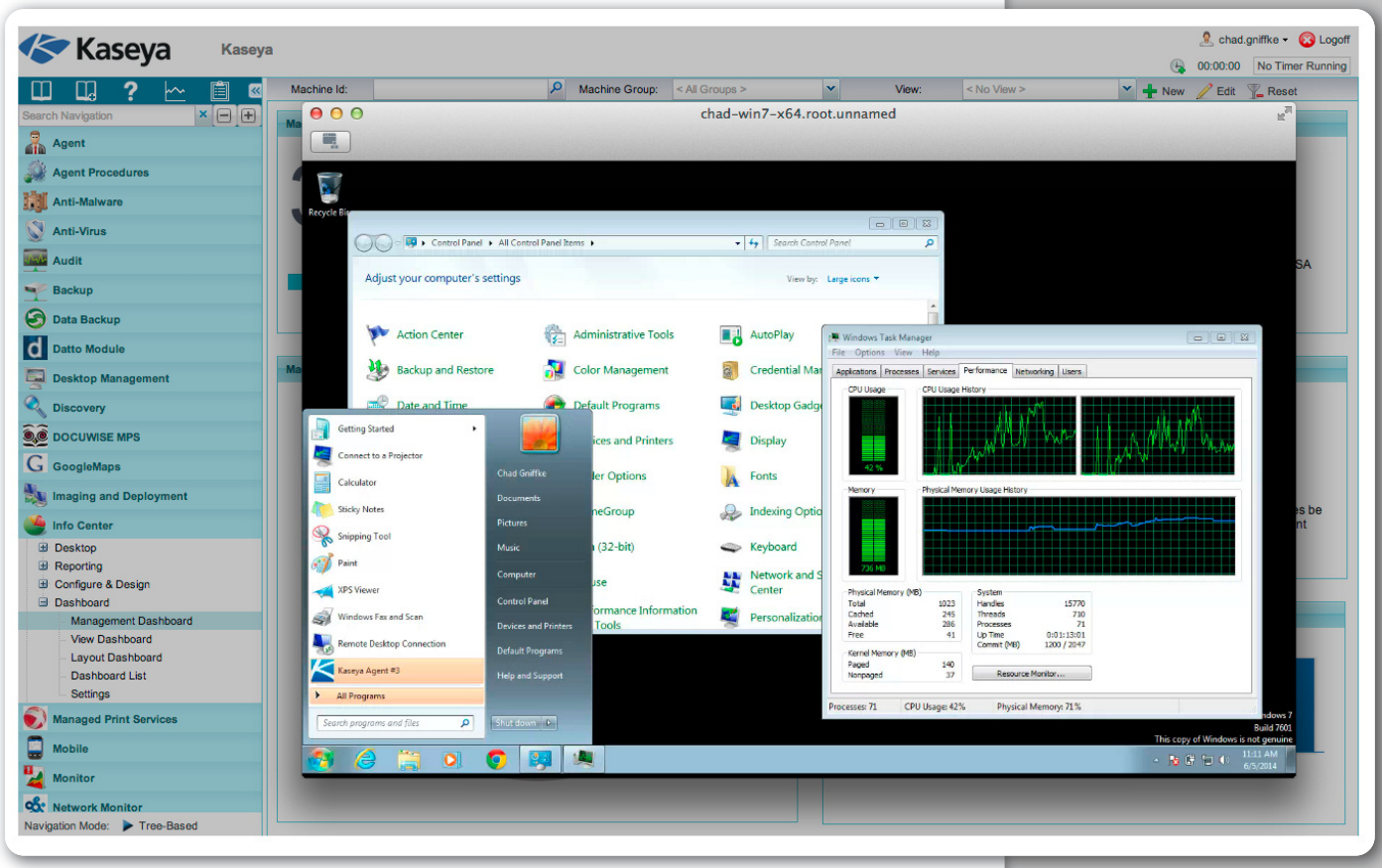
The Kaseya Solution

Kaseya Virtual System Administrator (VSA) delivers the fastest, most reliable remote management solution in the industry. IT professionals can access and manage computers from anywhere at near instantaneous connect times with extraordinary reliability, even over high latency networks. The VSA web-based, integrated IT management platform delivers a complete, fast and secure live remote control solution, even behind firewalls or when connecting from machines at home.

Kaseya VSA includes two modes of operation:

Remote Control enables the technician to take over the remote computer collaboratively with the end user. They can work collaboratively or the technician can work with full computing access as the currently logged in user. All operations are as if the technician were physically sitting in front of the computer.

Live Connect enables the technician to work behind the scenes without the end user's knowledge. The technician is able to fix problems in the registry, move or copy files, run a command prompt or script, view running tasks, and more. Meanwhile the end user is able to continue uninterrupted.



The Kaseya Virtual System Administrator (VSA) Remote Control module enables near instantaneous remote desktop management connections.

The Kaseya Technology

To achieve the fastest and most reliable remote management solution requires innovative new methods and technology.

Ready-to-Connect Agent: When first connecting the management server to a new agent, downloading remote desktop management binaries to the agent represents a substantial portion of the connect time. With VSA Remote Control, this delay is completely eliminated. Everything needed for Remote Control is included when the agent is initially installed, and is always available for immediate use.

Agent to Server Persistence: Likewise, the time to schedule and run an agent procedure against an agent has traditionally accounted for a large portion of the time to connect. Rather than attempt to optimize this, VSA Remote Control doesn't run an agent procedure at all. The VSA Server and Agent establish a persistent, lightweight, always-on connection between server and agent, which is available to start Remote Control immediately. Because of this persistent connection, commands can be sent, received and responded to in milliseconds. IT professionals can initiate a remote access request and receive a response from the agent in near real-time. This increases the time-to-connect speed substantially.

Parallel Set-up: Establishing a Remote Control session can involve a surprising number of individual steps. For example:

- Launch the viewer application
- Establish a connection from the viewer to the VSA server
- Perform encryption handshakes to ensure each connection is secure
- Send Remote Control session details to the agent
- Wait for the user to accept the Remote Control session (if required by policy)
- Establish relayed connectivity
- Collect network candidates for P2P connectivity
- Transmit P2P connection candidates over the network
- Perform P2P connectivity tests
- Select the best available network connection to start the session on

Most remote management technology communicates in a very sequential manner, meaning there is a "wait in line" restriction that slows down on-demand requests. With the VSA communication layer, remote control requests don't get queued behind other activities on the agent. In addition, all activities required to set up a remote control session are performed in parallel. For example, if end user permission is required to start a session, connectivity will be established behind the scenes in the meantime, so it's ready to go when the user is. This dramatically reduces the overall time required to establish each session.

Video Codec and Hardware Acceleration: Unlike other solutions, Kaseya Remote Control is built using a video codec. Once connected to a remote agent, VSA Remote Control will start streaming full screen video data over the network connection, and draw it to the viewer's screen. The video codec ensures that a minimal amount of data is sent over the network, especially if nothing much is changing on screen.

Popular high definition video compression and codec formats

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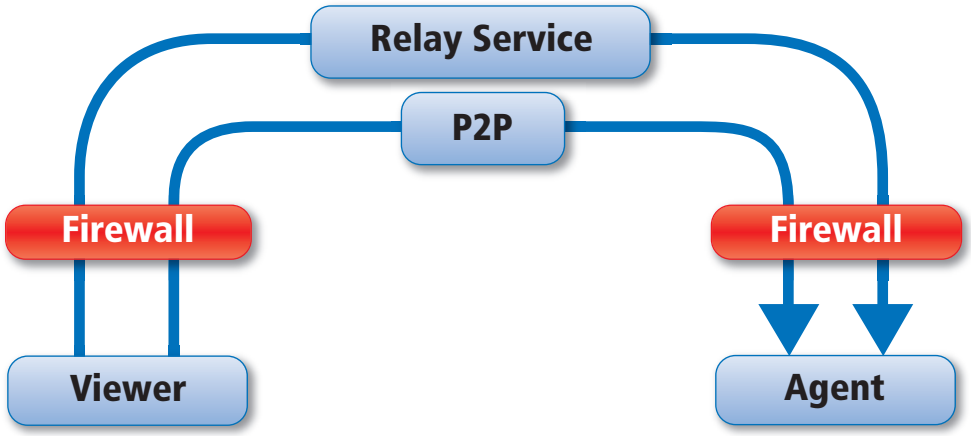
By using standard video codec technology, hardware acceleration is possible using the graphics processing unit (GPU) on both the admin and the endpoint systems. This drives increased performance and responsiveness, and is especially obvious when maintaining long-running connections to multiple remote agents.

VSA Remote Control will take advantage of continued advancement in video codec technology. Video streaming services like Netflix and Hulu use similar video codecs to send hi-def movies to their customers' computers. With the advent of these services, innovation in video codec technology continues to grow. Most has been focused on increasing video quality (i.e. hi-def) while reducing the bandwidth required. As the demand for 4K video grows, this technology will become more efficient and will enable the performance of VSA Remote Control to increase in turn.

Network Connectivity

One of the most important parts of getting a fast and reliable Remote Control session is the network connectivity approach. VSA Remote Control employs a couple of different approaches that provide certain benefits and advantages.



P2P and Relayed Connectivity for best remote control results

P2P Connectivity: Peer-to-peer connectivity is the preferred method of networking between the viewer application and the agent. It generally offers high throughput and low latency – and because the viewer and agent are connected directly, it places no additional load on the VSA server.

VSA Remote Control uses an industry standard protocol called ICE (Interactive Connectivity Establishment) to establish P2P connectivity. ICE is designed to test a wide variety of connection options to find the best one available for the current network environment. This includes TCP and UDP, IPv4 and IPv6, and special network interfaces such as VPN and Teredo.

In addition, ICE takes care of firewall traversal and NAT hole punching. To achieve this, it makes use of the fact that most firewalls and NATs allow reverse connectivity on ports that have been used for outbound connections. This ensures no additional firewall configuration is required to support VSA Remote Control.

ICE selects the best available P2P connection based on the type of connectivity, how long each connection takes to establish, and a variety of other factors. In practice, this means TCP connectivity will usually be established on local networks, UDP connectivity when crossing network boundaries, and VPN connectivity when no other options are available.

However, testing a wide variety of connectivity options can take several seconds – and in some network environments, it may not be possible to get a P2P connection on any network interface. In these situations relayed connectivity is used as well.

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Relayed Connectivity: As an alternative to P2P connectivity, Kaseya Remote Control also uses connections relayed through the VSA. Relayed connections are quick to establish and unlikely to be affected by firewalls or NAT devices. They also tend to be more stable over long periods of time, especially relative to P2P connections over UDP. In practical terms, a relayed connection is made up of outbound TCP connections from the viewer and agent to the VSA, where they are linked up for bidirectional traffic forwarding.

To minimize the network impact, relayed connections from the agent use the same port on the VSA as the agent does for check-ins. This means that anytime an agent can check in, it is also able to establish a relay connection. Conversely, on the viewer side, relayed connections use the same port on the VSA as the browser to view the VSA website - if one works, so will the other.

Combining P2P & Relayed Connectivity

It's clear that P2P and relayed connectivity both have distinct advantages. To obtain the best results, VSA Remote Control uses both types of connectivity in parallel. When a new Remote Control session starts, it immediately attempts to establish both types of connectivity. As soon as it obtains a connection of any type, the session starts. Typically, relayed connectivity will be established first. This results in very quick connection time.

With a session underway, VSA Remote Control continues to look for better connectivity options. In most cases, a P2P connection will become available within a few seconds. When a P2P connection is established, the session will immediately switch over from relayed to P2P connectivity. This is seamless to the user, and causes no interruption to video streaming or mouse and keyboard control. Even if a P2P connection is established, the relayed connection is maintained for the duration of the session. So if P2P connectivity drops off for any reason, VSA Remote Control will seamlessly switch back to the relayed connection, while attempting to establish a new P2P connection in the background.

The result is fast connection times, high throughput, low latency, and a robust Remote Control connection, all at the same time. No compromises required!

Summary

Given the frequency with which IT professionals need to establish remote control sessions, maximum speed and reliability are essential to maximizing IT efficiency. Kaseya's Virtual System Administrator (VSA) delivers the fastest, most reliable remote management solution in the industry. IT professionals can access and manage computers from anywhere at near instantaneous connect times with extraordinary reliability, even over high latency networks. To achieve this, Kaseya uses innovative new methods and technology, including agent to server persistence, parallel set-up, video codec, and combined P2P and relayed connectivity to establish network connectivity. In the end, Kaseya's solution delivers unparalleled speed and reliability so IT professionals can resolve issues quickly and keep their end users happy and productive.

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About Kaseya

Kaseya is the leading provider of cloud-based IT management software. Kaseya solutions allow Managed Service Providers (MSPs) and IT organizations to efficiently manage IT in order to drive IT service and business success. Offered as both an industry-leading cloud solution and on-premise software, Kaseya solutions empower MSPs and mid-sized enterprises to command all of IT centrally, manage remote and distributed environments with ease, and automate across IT management functions. Kaseya solutions are in use by more than 10,000 customers worldwide in a wide variety of industries, including retail, manufacturing, healthcare, education, government, media, technology, finance, and more. Kaseya is privately held with a presence in over 20 countries. To learn more, please visit **www.kaseya.com**

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