SOPHOS
Security made simple.

The Sophos Security Heartbeat:

Enabling Synchronized Security

Today's best protected organizations deploy multiple layers of security products and protections on their networks and endpoints in an effort to defend against known and emerging threats. While these deployments of host and network-based firewalls, content inspectors, malware analyzers, and event managers do a respectable job of defense; there is a fundamental deficiency in their deployment, namely they fail to make one another better. Our industry describes the underlying condition as "siloing," where our control and enforcement points operate in isolation, rarely than sharing information in any rapid, meaningful or practicable fashion. Such a lack of communication or synchronization means that we've all along been missing the chance to make our firewalls smarter by giving them process-level contextual insights that only our endpoints can have, or to giving our endpoint protections the ability to objectively assess their state of integrity or compromise based on network activity and context. The opportunity for improvement seems both obvious and vast.

The response to this recognized weakness has been to put more technology and people in place to attempt to overcome this lack of communication between endpoint and network defenses. While there are plenty of SIEM type-tools being proposed to IT Security teams that try and pull information, alerts and events from the two worlds of network and endpoint protections into one place, this approach has three fundamental challenges. – First, they tend to put all the effort into normalizing and structuring the event data from disparate sources, and very little into extracting actionable information from the resulting sea of data. Secondly they are inherently after the fact, investigative tools. And third, they drive up staffing and headcount requirements to build and monitor the fragile and complex correlation rules they depend on. And even then, on the chance that an analyst, if you even have one available, has managed to trawl through the events, the bad guys have long gone with your data.

While Sophos endpoint and network products are simple yet powerful, effective and efficient, they too have been isolated and have not communicate well with each other. Until now, putting together the information from one product in order to act effectively across the organization has been slow and tedious, and often impractical. Seeing this challenge in our customer base, Sophos has released a revolutionary new technology, which we call the Sophos Security Heartbeat.

A new approach is needed that is built to work in a synchronized way, establishing communications between network and endpoint products, and enabling automated and coordinated communication and action, but without creating yet another layer of complexity and cost. The Sophos Security Heartbeat was developed to solve this problem and to deliver a new level of protection to organizations and their resource constrained IT Security teams. This paper outlines the basic design and functioning of the Sophos Security Heartbeat and shows how it delivers better and faster protection through Synchronized security.

Synchronized Security, a Simple Solution to a Vexing Problem

Imagine posting security guards inside and outside of your building, but not giving them 2-way radios to communicate with each other. Imagine if they had separately send information to a centralized system with a human watching out for information that might be meaningful to each of the individual guards. Now imagine many buildings with fences and guards around them and other guards in every room, all sending summaries of what they see to a central authority who must make sense of those signals. And imagine if the outside guards worked for a different manager than the inside ones. And worse off, what if the IDs of the radios where constantly changing, so it was hard to identify who was sending any given message. And lastly, put yourself in an environment where intruders are constantly challenging your defenses with new and innovative and stealthy techniques. Amazingly, this is precisely the situation that IT security teams face today.

Dealing with these threats and complexity has created nearly insurmountable challenges for even the world's largest organizations. They have deployed scores of analysts and new technologies such as big data warehouses and Security Information and Event Managers (SIEMs) to coordinate and make sense of this distributed, silo'd set of endpoint and network solutions The typical deployment, greatly simplified, looks like Figure 1.

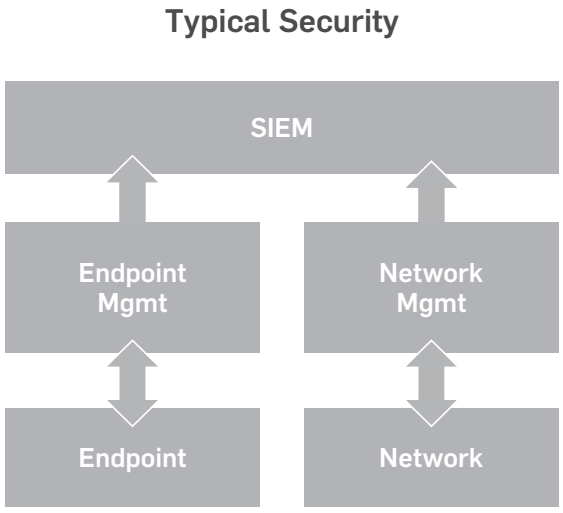

Figure 1: Typical solutions try to correlate and make sense of data and require headcount and scarce expertise

And while there is some merit to this approach; it is resource intensive, requiring specialized and highly skilled staff in order to make sense of incoming signals to find real problems. But even in that case, it does nothing to speed the back end of the process of responding to new threats. Because the management and implementation of endpoint and network products remains isolated, it is complex challenging and fragile to coordinate activity across these products.

Most IT Security organizations can't possibly hire or react fast enough to protect themselves by implementing, maintaining and using these complex and silo'd products. This results in inefficacy and ineffectiveness. And when that happens, the attackers all too often win.

Now for the first time, endpoint and network protection can operate as one integrated system, enabling organizations to more quickly and efficiently prevent, detect, investigate, and remediate threats. As shown in Figure 2, an alternative, synchronized security framework unifies management and connects endpoint and network security solutions directly to each other, allowing them to communicate to each other in real-time.

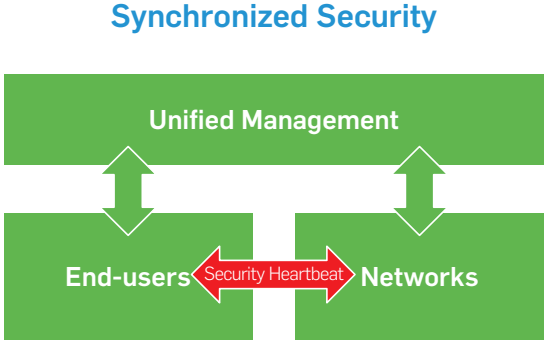

Figure 2: Synchronized Security simplifies and unifies communication and management

By sharing intelligence via a security heartbeat, this framework can discover and understand advanced threats faster and automate correlation across endpoints and networks, as well as automate and extend protection and quicken incident response. Simplified management makes the framework easy to set up and manage without requiring additional event managers or staff analysts. In short, Synchronized security provides better protection in a more cost and time efficient manner than other approaches. Table 1 summarizes the difference between these approaches.

	Synchronized Security	Typical Security
Intelligence	Shared	Isolated
Correlation	Automated	Manual and partially automated
Unknown Threat Discovery	Contextually assisted	Unassisted
Incident Response	Highly targeted	Imprecise
Additional Product and Headcount Investment	None	Significant
Management	Simple and unified	Complex and silo'd

Table 1: Characteristics of Synchronized vs. Typical Security

The Sophos Security Heartbeat – Enabling Synchronized Security

The Sophos Security Heartbeat connects the Sophos Endpoint Clients to the Sophos Network Security Gateways, creating a channel for realtime information sharing between products. Enabled and managed from the Sophos Central, the Security Heartbeat is easy to set up and manage. It utilizes secure communications to pass intelligence, events, information and commands between deployed endpoints and network firewalls.

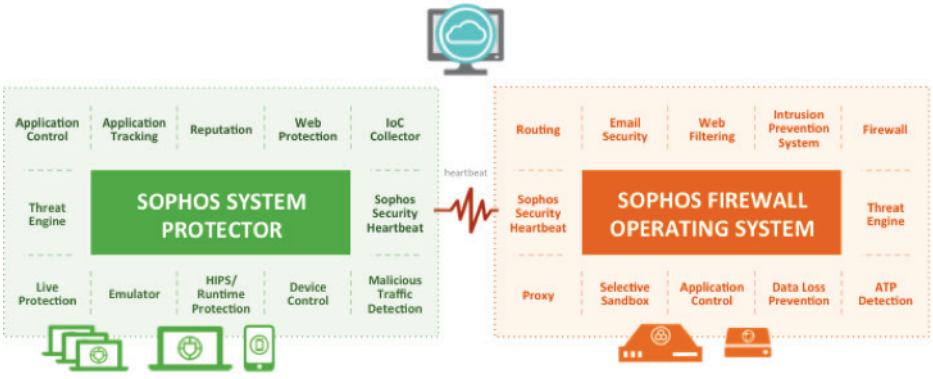

Figure 3: The Sophos Security Heartbeat connects Sophos Next Generation Endpoint and Network Protection

As shown in Figure 3, Sophos Security Heartbeat is an integrated capability in the Sophos Next Generation End-user Security and Network Firewall products. The Sophos Heartbeat allows the Sophos endpoint and network security solutions to continuously share meaningful information about suspicious and confirmed bad behaviour across the entire organization's extended IT ecosystem.

By deploying Sophos Security Heartbeat, organizations can find advanced threats sooner, automatically identify compromised systems, automate incident response and have instant visibility into endpoint security status.

Setting Up The Sophos Security Heartbeat – Simply Register and Go!

Setting up the Sophos Heartbeat is fast, straightforward and simple.

You simply enter your Sophos Central credentials into the Sophos Firewall User Interface and the Firewall will automatically identify itself and register with the Sophos Cloud. From that point on, you can see and access all registered Firewall in Sophos Central. This is shown in Figure 4 and 5.

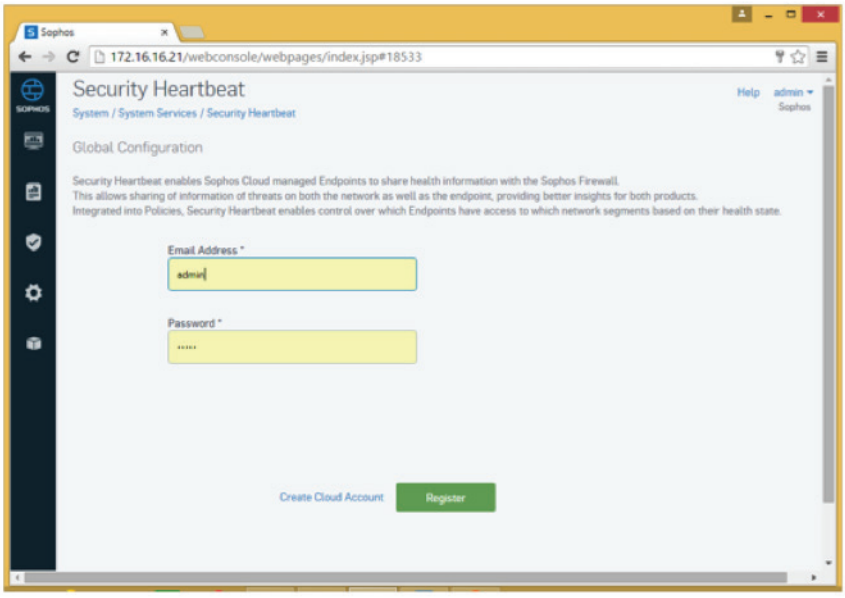

Figure 4: Simply enter your Sophos Central credential to register a Firewall for the Security Heartbeat

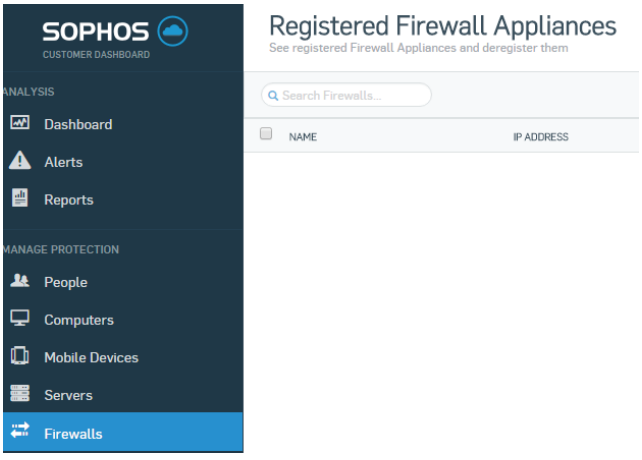

Figure 5: The Sophos Firewall is now registered with the Sophos Central

As soon as the first Firewall is registered with Sophos Central, the following all happens automatically:

- The computers receive security information that enables a Heartbeat connection to the Firewall.
- The Firewall receives security information that enables a Heartbeat to the computers.
- Each computer starts to send connection requests to a Firewall that could protect it. Computers connect to the nearest available registered Firewall (their default gateway).
- If the Firewall sees a connection request, it checks the security information to confirm that it is one of your endpoints and completes the connection if valid
- The computer also validates that the Firewall is yours by checking its security information received from Sophos Central.

That's it. No complex rules, configurations or updates. You are now ready to see the Sophos Heartbeat in action.

Sophos Security Heartbeat in Action

With the Firewall and endpoint clients now connected via the Security Heartbeat, system health information now starts to flow from the connected endpoints to the Firewall as well as the Sophos Central management platform.

As shown in Figure 6, the Sophos Firewall dashboard now populates which displays the number of and health status of all computers connected to that Firewall. Client health status can be **red, yellow or green**.

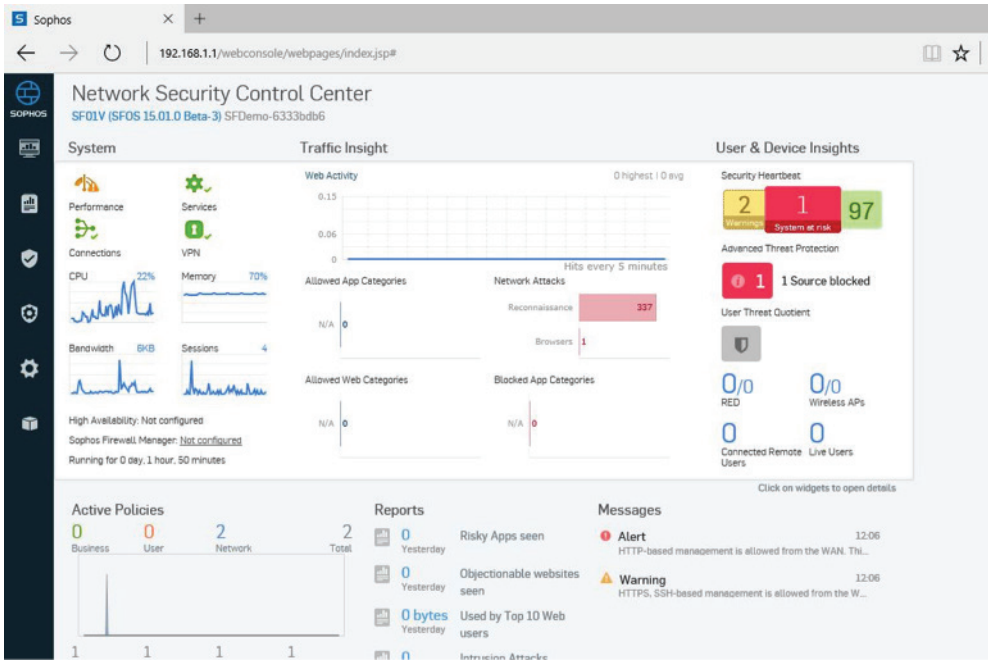

Figure 6: Firewall dashboard displays the health of connected endpoints ad green, yellow or red. in this case, ninety-seven endpoints are green, one is red and two are yellow.

What Health Status Tells You?

Table 2 summarizes the meaning of the Green, Red and Yellow Indicators. Red indicators should be dealt with immediately while Yellow indicates risk, but not urgency.

Possible Alert Triggers	Red	Yellow	Green
Malware Detected	X – Active	X- Inactive	
Potentially Unwanted Application		X - Detected	
Malicious Network Traffic	X – Communication from endpoint to known or suspected bad host		
Sophos Security Software Not working correctly	X – System may lack protection		
No detections, Security software working correctly			X

Table 2: Endpoints report health status to Sophos Firewall and Sophos Central based on simple but powerful triggers, allowing staff to speed discovery and prioritize follow-up

In addition, the Sophos Endpoint software use the Security Heartbeat to send detailed information to Network Firewall Dashboard, allowing staff to drill down into details as shown in Figure 7.

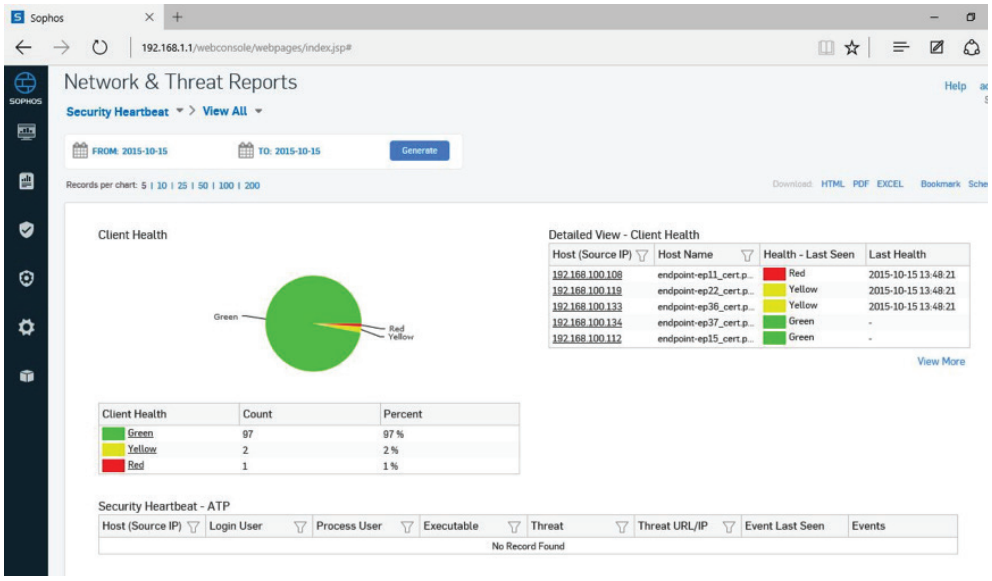

Figure 7: Drilling into client health dashboard shows details of health status and triggers by client

Extending Network Protection Through the Security Heartbeat and Firewall Policy

Knowing the status of client health is one thing, but acting effectively and quickly is another matter altogether. Sophos Security Heartbeat allows Firewall administrators to set up simple yet highly effective policy to leverage the knowledge of client health providing automated and effective network protection to the organization.

As shown in Figure 8, Firewall rules can be easily created, taking advantage of this visibility. Here we have created 2 rules, Amber and Red. Our Amber rule will allow Internet access to systems in yellow or red health state, but block access to Salesforce.com as a precaution. Our Red rule, blocks all Internet access from those clients in Red Status. When a system changes status, these rules provide network level protection prior to system remediation, dramatically lowering the risk of loss.

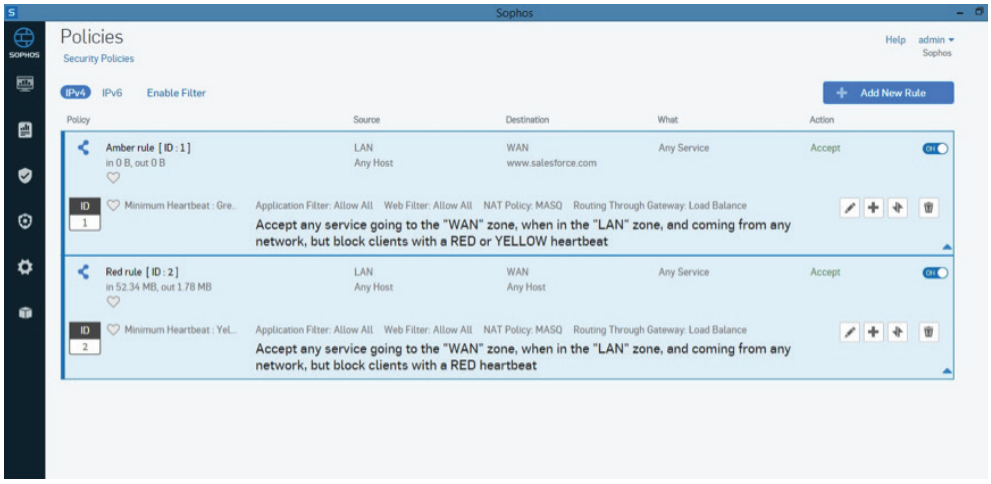

Figure 8: Simple Firewall policy can be set to enhance protection leveraging the information provided by the Sophos Security Heartbeat

Figure 9 shows the block screen that an end-user will receive after this Amber rule is enforced by the Sophos Firewall.

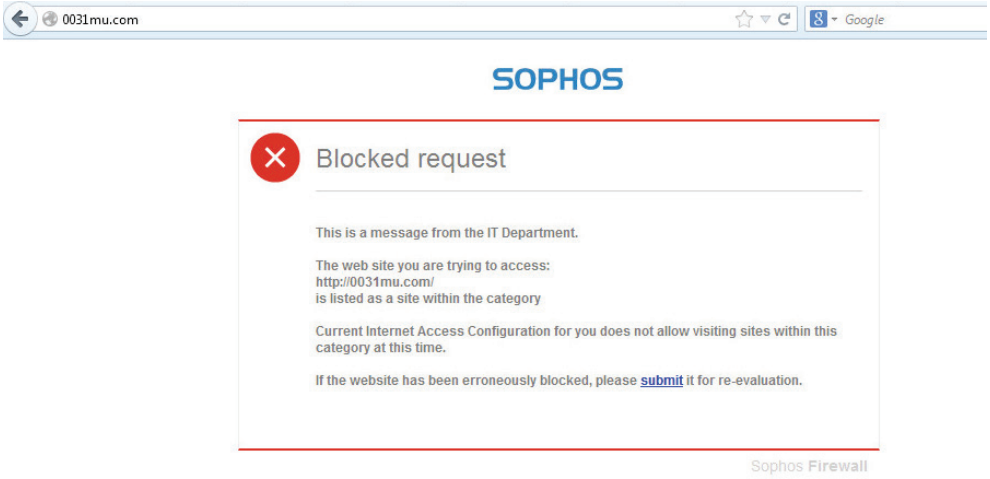

Figure 9: End-user message after enforcement of the amber rule

Advanced Threat Protection (ATP) Alerting and Action with Sophos Security Heartbeat

The Sophos Security Heartbeat automates ATP alerting and response between the Sophos Firewall and Sophos Endpoints, dramatically reducing investigation time, threat detection and remediation.

For instance, if the ATP feature on the Firewall detects suspicious traffic, it will utilize the Security Heartbeat to see if the traffic is coming from an endpoint with an active heartbeat. If this is the case, the Firewall will use the Security Heartbeat to get the machine name,the logged in user, and the process name that triggered the Firewall ATP alert. This step alone can often take hours and days of manual labor in traditional environments without a Heartbeat service.

This information is then displayed in the ATP Alert screen of the firewall as shown in Figure 10.

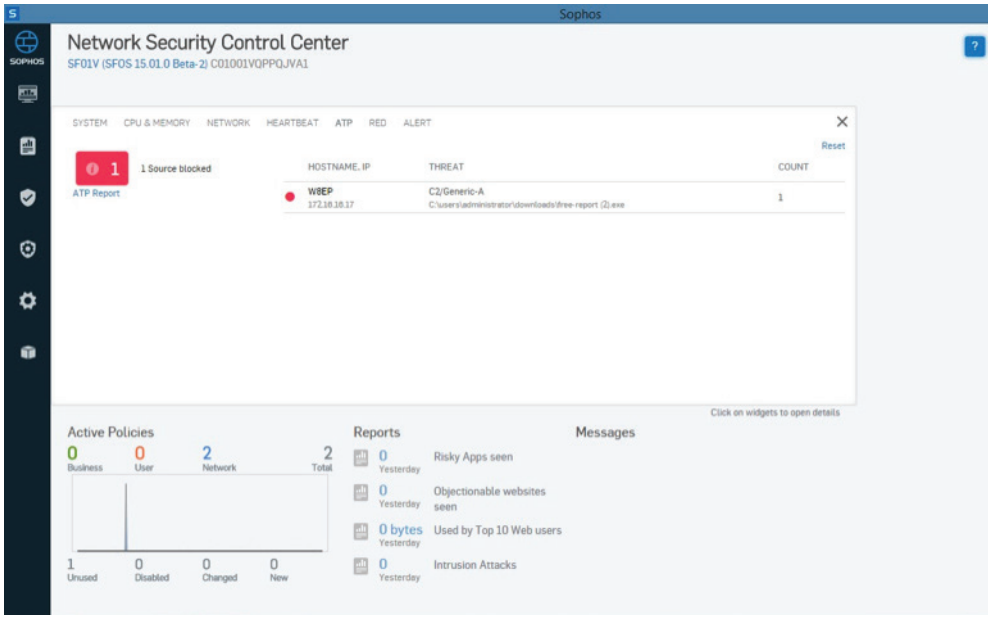

Figure 10: ATP alerting in Firewall user interface

After actively identifying the endpoint affected by the advanced threat, the endpoint simultaneously alerts the Sophos Saas Management Console as shown in Figure 11. With the same threat, machine, user, and process information sitting in both the endpoint (Sophos Central) and network (Sophos Firewall), the Security Heartbeat has enabled synchronized security.

Figure 11: ATP Alerting automatically reported on in Sophos Central Manager

The Sophos Cloud now instructs the HIPS feature of the Sophos Client to see if malware can be positively identified and remediated on the machine. As there is a suspicion of active malware on the computer, its health status turns Red. The Sophos Firewall now provides additional protection by enforcing policies such as the Red rule from above, eliminating any damage while remediation is in process.

Summary

The last ATP protection example is an outstanding demonstration of the power and simplicity of Synchronized security powered by the Sophos Security Heartbeat. All of this happens with NO manual intervention, no investigation and no manual processes, while delivering full visibility and audit trail of activities. No staff, no mess, no time lags. Just Synchronized security, delivering more and faster protection with no additional staff.

The threats faced by organizations today can seem daunting, and typical answers require a level of resources, specialized expertise and staffing that is just not available to most organizations. Synchronized Security changes the dynamic of this, providing better protection through simple yet powerful communications and management between previously silo'd solutions, without adding staff or complexity. Organizations deploying the Sophos Security Heartbeat get instant visibility into endpoint health status, accelerated discovery of advanced threats, active identification of compromised systems and automated incident response.

To learn more and see how synchronized security and the Sophos Security Heartbeat can enable you to win in today's risky world, visit Sophos.com/heartbeat.

Sophos Security Heartbeat

To learn more, visit **sophos.com/heartbeat**

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