Using Intel® vPro™ Technology with a Centralized IT Support Portal

Our centralized portal supports Intel IT's efforts to improve employee productivity and reduce support costs.

Executive Overview

A team of Intel IT support personnel and IT engineers has built a web-based portal called SupportIT to increase the effectiveness of our support agents and improve efficiency. This portal integrates more than 20 tools and data sources, enabling support agents to quickly resolve a reported problem as well as proactively identify a variety of known problems and fix them before they negatively affect the IT customers' productivity.

The SupportIT portal's integration of Intel® vPro™ technology features provides an elevated level of IT customer support. Based on an agile development methodology, the portal provides dynamic, adjusted content representing Intel IT's constantly changing computing environment.

These four main solution components underlie the root-cause analysis and proactive support capabilities of the portal:

- A web interface based on a search-engine concept

- An integration engine that combines data from all the data sources used for IT support into a single data structure

- An analysis engine that uses the integrated raw data to create more relevant results

- A client device agent that collects information about the client device

The first production version of the SupportIT portal was ready in mid-2012. Now that the portal is in production, we are adding more capabilities based on support agents' input. As data sources and tools are added to our IT environment, we integrate

them into the SupportIT portal so that it remains up to date with the capabilities our support agents need in order to quickly and efficiently perform their job.

Preliminary data suggests that the portal can significantly improve IT support at Intel:

- During a four-week proactive support pilot, the piloting team used the portal to proactively identify more than 20 known issues before they became problematic to IT customers.

- IT customers accepted support agents' suggested fixes more than 90 percent of the time.

- The portal has reduced the time it takes to obtain model number, encryption state, system and OS health parameters, and other device information from client devices from 5 minutes to 30–60 seconds. During 2013, the portal was accessed over 200,000 times by our support agents; this represents hundreds of support hours saved during the year.

These results illustrate that our centralized SupportIT portal can help improve employee productivity and reduce support costs.

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Contents

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BUSINESS CHALLENGE

Support agents working at the Intel IT Help Desk and PC service centers support approximately 100,000 Intel employees and contract workers who use about 140,000 devices. No two systems are alike. There are multiple OSs, many different hardware types, and over 2,000 applications.

In addition, Intel employees retain administrator rights on their devices—meaning they can install additional drivers and applications beyond the corporate build. Such a diverse, complex IT environment demands support efficiency and accuracy to maintain employee productivity, job satisfaction, and trust in Intel IT.

With such a large number of users, devices, and applications, our support agents need to be experts at quickly finding the root cause of a reported problem. But it is not enough to be reactive. To enable a healthy IT environment that allows employees to be as productive as possible, support agents must be able to proactively identify and fix issues before they negatively impact IT customers.

Over the last few years, we have made a concerted effort to improve both our ability to perform root-cause analysis and proactive support; however, we wanted to do more to improve customers' productivity and reduce support costs.

Improving Root-Cause Analysis

Our support agents use more than 20 tools to troubleshoot reported issues. These tools have widely differing GUIs. Most have individual log-in processes. The lack of integration between the tools makes it difficult for support agents to be proficient in resolving any given problem. In addition, most tools merely display raw data, which can be time-consuming and difficult to analyze.

Together, these issues make it challenging for support agents to identify the root cause of a problem, resulting in the following:

- Lack of easy access to an IT customer's ticket history

- Frustration for support agents and IT customers

- Long ticket resolution times

- Repeated attempts to fix the same problem

Improving Proactive Support

Our IT support model has included proactive support for several years. We regularly harvest data from the environment to identify existing and emerging issues, and then categorize and prioritize those issues based on business impact, business value, and available IT resources. We then apply a problem management cycle to analyze the top-priority issues, deploy solutions, and measure the results. Targeting specific critical issues such as potential hard drive failures and the blue screen of death (BSOD) enables us to minimize intervention with IT customers and avoid overloading support agents with less critical issues.

Using this methodology, we are able to proactively identify a customer's PC issues and offer them remediation before their productivity is impacted. For example, customers with solid-state drive (SSD) performance issues are identified and invited to our PC Service Center for an evaluation and replacements if needed—avoiding SSD total crashes, which can cause a significant productivity loss.

We realize the benefits of our proactive support efforts. However, we felt we could offer additional support if our support agents had access to data that is more relevant and an efficient method to provide less critical, yet proactive information to IT customers during a remote support session.

SOLUTION

In 2012, Intel IT support personnel and IT engineers built a web-based portal called SupportIT. As shown in Figure 1, the portal integrates many tools and data sources. Access to this consolidated information prepares support agents to quickly resolve a reported computer or technology problem.

The portal shows the IT customer's ticket history, which allows the support agent to easily determine if a problem has been previously reported and what was attempted to fix it. The portal also enables support agents to efficiently identify a variety of known problems on a client's device and fix them before they negatively affect the IT customer's productivity.

Because the SupportIT portal enables support agents to resolve reported problems quickly and identify and fix problems the IT customer may not even know exist, the portal boosts efficiency, productivity, and job satisfaction for our support agents—and for our IT customers.

SupportIT Portal Overview

The SupportIT portal is based on an easy-to-use web interface. Therefore, support agents do not need to install a separate application. This allows support agents to be productive using any web-enabled computer and virtually any browser.

The portal integrates information from many IT support tools—including Intel® vPro™ technology[1] features—as well as relevant processes and diagnostic information, increasing the chances of resolving an issue the first time. The portal's customer relationship management (CRM) capabilities provide support agents with access to all the relevant information about IT customers and their devices. This type of information helps speed up root-cause analysis and issue resolution.

The portal uses business intelligence (BI) techniques to proactively identify problems that exist on the client device, even though the IT customer may not know they exist and hasn't yet experienced difficulties.

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[1] Intel® vPro™ technology is sophisticated and requires setup and activation. Availability of features and results will depend upon the setup and configuration of your hardware, software and IT environment. To learn more visit: www.intel.com/technology/vpro.
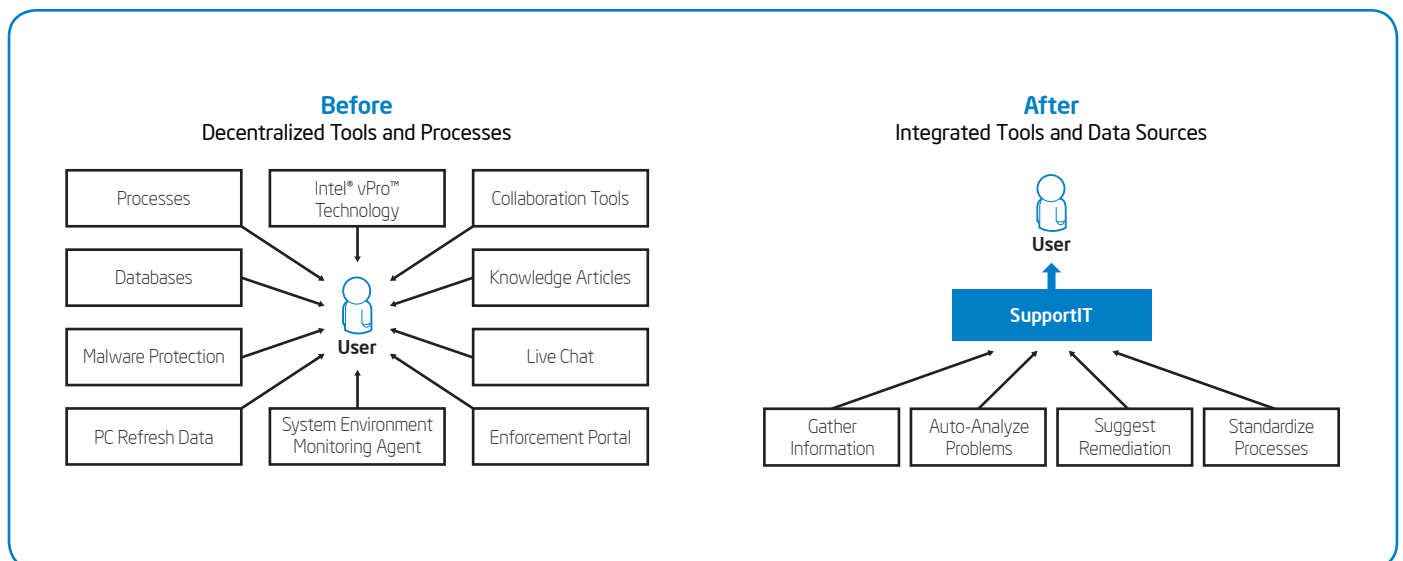
The portal boosts efficiency, productivity, and job satisfaction for our support agents—and for our IT customers.

Before
Decentralized Tools and Processes

- Processes
- Intel® vPro™ Technology
- Collaboration Tools
- Databases
- Knowledge Articles
- Malware Protection
- Live Chat
- PC Refresh Data
- System Environment Monitoring Agent
- Enforcement Portal

User

After
Integrated Tools and Data Sources

User

SupportIT

- Gather Information
- Auto-Analyze Problems
- Suggest Remediation
- Standardize Processes

Figure 1. The SupportIT portal gathers information from a variety of sources and provides an integrated view of device and IT customer data.
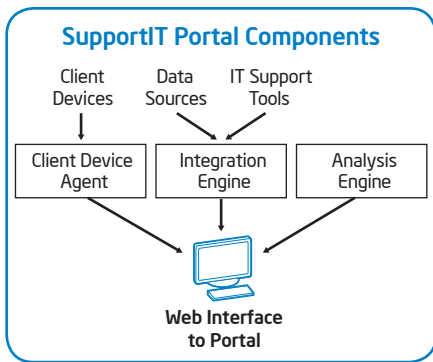
SupportIT Portal Components

Figure 2. Accessed through a web interface, the SupportIT portal includes integration and analysis engines as well as a client device agent.
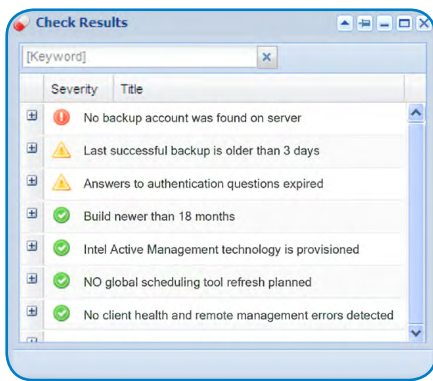

Figure 3. The information in the SupportIT GUI enables support agents to view the status of an IT customer's device and OS.

Portal Components

As shown in Figure 2, the SupportIT portal comprises four main components:

- A **web interface** provides convenient access to the portal.

- An **integration engine** incorporates data from all the data sources used for IT support into a single data structure.

- An **analysis engine** uses the integrated raw data to create more relevant results.

- A **client device agent** collects information from the client devices.

Each of these components is discussed in following sections.

WEB INTERFACE

To access the SupportIT portal, support agents log in using their privileged administrative account. Using a "single sign-on" approach gives support agents access to various support tools without requiring them to log in again. Once logged in, support agents can use a familiar search engine GUI to search for a variety of criteria, including the IT customer's username; employee number; an incident tracking system ticket number; or

the IT customer's device name, IP address, hardware serial number, or disk serial number.

The portal uses the search criteria to display relevant information, such as all the devices registered to an IT customer, which devices are online, and which is the IT customer's primary asset. For each asset, the portal displays many categories of information such as hardware and OS information, stability and backup history, security compliance status, and relevant event logs. Figure 3 shows a sample of the SupportIT interface. The portal also enables support agents to take device-specific actions, such as starting a Keyboard-Video-Mouse[2] (KVM) Remote Control session or remotely resetting an IT customer's whole-disk encryption password using Intel vPro technology (see sidebar, "Integrating Intel® vPro™ Technology with SupportIT").

Support agents can customize the portal's GUI. For example, the search box features the ability to access previously conducted searches. Also, windows can be resized, maximized, minimized, and collapsed.

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[2] KVM Remote Control (Keyboard, Video, Mouse) is only available with Intel® Core™ i5 vPro™ and Core™ i7 vPro™ processors with Intel® Active Management technology activated and configured and with integrated graphics active. Discrete graphics are not supported.

Integrating Intel® vPro™ Technology with SupportIT

To increase Intel IT's ability to maintain, manage, and protect client devices while decreasing management costs, in 2011 we completed provisioning Intel® vPro™ technology on corporate-owned devices equipped with Intel® Core™ vPro™ processors. Intel vPro technology provides out-of-band (OOB) manageability through Intel® Active Management Technology (Intel® AMT). OOB capabilities help reduce costly desk-side visits while meeting IT customers' growing expectation for remote support.

The following support activities that use Intel vPro technology are integrated into the SupportIT portal:

- **Keyboard-Video-Mouse (KVM) Remote Control.** Unlike software-based KVM solutions, hardware-based KVM Remote Control is not limited to only situations that occur when the OS is operational. Intel Core vPro processors with KVM Remote Control enable support agents to diagnose and repair devices experiencing severe hardware problems, or when the OS doesn't work, which accounts for a significant number of IT Help Desk calls. For example, we received about 4,000 calls related to boot issues in the second half of 2012. KVM Remote Control enables support agents to provide a high level of service without a desk-side visit or sending the employee's device to a repair center.

- **Remote encryption passphrase reset.** Our support agents receive thousands of calls related to passphrases every year. Intel vPro technology enables us to access a PC's user interface remotely OOB, including on-screen error messages. This allows us to repair systems directly instead of having to talk employees through a diagnostic and repair process over the phone.

These examples show that Intel vPro technology extends manageability to the compute continuum, while reducing management costs and employee downtime, resulting in greater employee productivity. For example, using KVM Remote Control to solve a problem saves each remote employee more than USD 100 on shipping alone and more than 10 hours of employee downtime, on average.

There is also a pin feature that can store the preset size and location of windows on the desktop for future sessions. Other features include data filters; integration with the Windows* Clipboard; access (in some cases) to the direct source of the information displayed in the window; and a list of recent outages, such as email errors, drivers causing system crashes, or scheduled maintenance.

INTEGRATION ENGINE

Our support agents use data from as many as 20 sources, including (but not limited to) our configuration management database (CMDB), knowledge articles and document-sharing portals, system error logs, an incident tracking database, VPN error logs, and data from the device itself. The integration engine simplifies the support agent's task by gathering information from all the relevant sources and displaying it in a centralized format. This information may relate not only to a specific issue, but also to the general environmental status for a particular device.

The portal obtains CRM data from the following two sources:

- **Real-time data** about the IT customer and client devices is available from the client device agent when the device is connected to the corporate network.

- **Offline data** about the IT customer and client devices is also available even when devices are not connected to the network, but is not real-time (could be 24 hours outdated).

To provide the best possible user experience for support agents, we designed the integration engine to display the older CRM data first because it is faster to retrieve. That way, the support agents have information immediately available so they can start working on a resolution. However, real-time data replaces the older data as soon as it becomes available.

To avoid overwhelming the support agent with too much information, the integration engine uses BI to provide the most relevant content for what the support agent searched for. Some basic information is always included, such as the IT customer's

identity, the device name, the business unit, and the IT customer's primary asset.

ANALYSIS ENGINE

Instead of masses of raw data, the portal displays an intelligent analysis of the integrated data, focusing on the following tasks:

- **Root-cause analysis.** This feature helps the support agents quickly identify the root cause of the reported problem. Here are two examples:

  - **The IT customer cannot send or receive emails.** Typically, the support agent would first try to troubleshoot email application issues—but with the information provided by SupportIT, the support agent can see that the PC is under enforcement (the PC is locked and disconnected from the corporate network because the PC is missing critical security patches or is infected with a virus). Therefore, the support agent can immediately start working according to the enforcement process instead of spending time on non-related troubleshooting steps.

  - **The IT customer's device performance has degraded.** SupportIT alerts the support agent that the temporary files are taking up too much space. An appropriate solution would be to clean up the temp directory.

- **Proactive support.** This feature helps identify other existing problems that may have not been reported yet. Here are some more examples of problems the portal can identify:

  - Incomplete backup
  - VPN client errors
  - Disk errors
  - Outdated drivers
  - Intel® Active Management Technology[3] (Intel® AMT) status
  - BSOD causes

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[3] Requires activation and a system with a corporate network connection, an Intel® AMT-enabled chipset, network hardware and software. For notebooks, Intel AMT may be unavailable or limited over a host OS-based VPN, when connecting wirelessly, on battery power, sleeping, hibernating or powered off. Results dependent upon hardware, setup and configuration. For more information, visit www.intel.com/amt.

- Expired account passwords
- Encryption not installed
- System is lacking critical software or security patches, or is infected by a virus

The analysis engine compares the gathered data to standard configurations and known-issues lists and identifies discrepancies and anomalies. Based on this comparison, it identifies the appropriate solution and provides a support script or a one-click solution for the issue when possible. The analysis engine also produces an incident-tracking-system ticket with relevant information for future review and audit.

CLIENT DEVICE AGENT

The client device agent is a discrete component of the system that collects real-time data from the IT customer's device when it is connected to the corporate network. The data collected by this component has higher validity than offline data sources, which do not store real-time data.

Real-time data collected by the client device agent serves two additional purposes: It completes any missing data which is not available from other online sources and it identifies the most recent system configuration.

Development and Adoption Methodology

A team of IT support personnel and IT engineers began developing the portal in early 2012. The first production version was ready only six months later, in mid-2012. We achieved results in such a short time by using an agile application development methodology, working in eight-week sprints and delivering a working product at the end of each sprint, adding capabilities in phases.

We also included user feedback in our development efforts. For example, in the first version of the portal, support agents were dissatisfied with having to wait for a minute or more for data. Therefore, in the next iteration of the portal, we modified it so that some initial data appears immediately, and subsequent data appears as it becomes available. Support agents no longer had to wait for all data to be available before they could start using it.

We developed the portal so that it can adjust to environment changes, such as when encryption types change, new form factors become available, or support tools are added and deleted. This is an important aspect of the portal's design, because our complex IT support environment is in constant flux, and the portal must provide support agents with the most up-to-date information.

When the portal was fully functional, we conducted a four-week pilot in mid-2013 to facilitate a global adoption of the portal's proactive support capabilities. During the pilot, we asked support agents using SupportIT the following questions to determine how it needed to be modified to fit their needs:

- What other system checks would you like to add to the analysis engine?

- What other functionalities would you like to see incorporated into the portal?

- What specific processes do you perform that can be added to SupportIT?

We also conducted capability-specific pilots to test and raise awareness of certain capabilities, such as the portal's remote password reset feature.

After the development of the portal was complete, we published a user's guide and training video to help educate our support agents about the portal. We also provided training to select support agents. These support agents, now subject matter experts, can serve as mentors and trainers for rest of the IT support team. Also, we occasionally release new versions of the portal based on new requests from our support agents and in alignment with new support tools capabilities being introduced to our support teams.

> While it may be difficult to associate throughput reduction directly to [the portal] because of all the environmental inputs, we can certainly demonstrate the mass reduction of process steps.
>
> — Rachel Camero,
> Service Desk Project Manager

RESULTS

We are still gathering data about the time and cost savings associated with use of the SupportIT portal; however, some preliminary data suggests that the portal will significantly improve IT support at Intel.

For example, during a four-week pilot of the proactive support features of the portal, the piloting team identified more than 20 known computer or technology issues. IT customers accepted the support agents' suggested fixes more than 90 percent of the time. For 2013, the SupportIT portal was accessed more than 200,000 times, and generated 48,600 proactive tickets.

Pulling and displaying data from client devices takes about 30 to 60 seconds, compared to the 5 minutes or more it used to require. The extensive usage of the SupportIT portal during 2013 saved support agents and their IT customers hundreds of valuable hours.

The Best Ideas Come from the Field

Ori Shahar is the product manager for the SupportIT portal. He has been with Intel for 14 years. He said that the best part of his job is helping Intel employees improve their productivity by providing them with capabilities that support their computing needs. He believes the best ideas for efficiency improvements come from the "ground" (the people who actually do the work).

In the case of SupportIT, Ori said the desire to develop such a capability came from the fact that he and his team have experienced the challenges of a support team themselves, "back when we were providing support to Intel engineers...we knew exactly what needed to be fixed. The combination of real-life experience in the service desk world and good technical capabilities for developing software solutions allowed us to come up with the tool."

The most challenging aspect of the SupportIT portal, said Ori, was developing the ability to collect information from the IT customer's PC over the network. The solution, he said, was to create a client device agent that is sent to the client PC on demand to collect the information.

Rachel Camero, service desk project manager, is enthusiastic about the solution. She said, "I am getting a lot of great comments about [the portal] from the floor. It is truly saving the support agents a lot of time. They no longer have to explain so many details to help the customers obtain vital information that helps [the agents] diagnose problems."

By sharing his team's and SupportIT's story, Ori said he hopes to showcase that "the best solutions for IT service centers and support teams will always come from people who actually worked in that area and have personally experienced the challenges that support personnel have these days in our complex IT environment."

We intend to gather data about the following two metrics, which can help reduce support costs:

- Reducing the time it takes to resolve a ticket (mean time to repair)
- Improving throughput time (handling more tickets in the same amount of time)

We also anticipate benefitting from indirect impacts, which may be more difficult to measure:

- Improving support personnel productivity and efficiency
- Standardizing quality of support across geographies and Intel organizations
- Preventing future incidents through proactive support

These indirect impacts can help reduce resolution time and increase resolution quality, thereby increasing IT customer satisfaction. They can also enhance support agents' user experience.

CONCLUSION

Intel IT has built a web-based portal called SupportIT to increase the effectiveness of our support agents and improve efficiency. The portal enables support agents to access more than 20 data sources and support tools, including capabilities based on Intel vPro technology. This centralized environment enables support agents

to quickly resolve a reported problem as well as proactively identify a variety of known problems and fix them before they negatively affect productivity.

The root-cause analysis and proactive support capabilities of the portal are enabled by four main solution components:

- A **web interface** based on a search-engine concept
- An **integration engine** that combines data from all the data sources used for IT support into a single data structure
- An **analysis engine** that uses the integrated raw data to create more relevant results
- A **client device agent** that collects information from client devices

Preliminary data suggests that the portal can improve employee productivity and reduce support costs. For example, during a four-week proactive support pilot, the piloting team used the portal to identify more than 20 known computer or technology issues before they became problematic. During this same pilot, IT customers accepted the support agents' suggested fixes more than 90 percent of the time. The portal can pull data (such as model number, encryption state, and other device information) from client devices in 30 to 60 seconds, compared to the 5 minutes or more to it took to obtain this data before. We are confident that SupportIT will continue to help us increase customer satisfaction.

RELATED INFORMATION

Visit www.intel.com/IT to find content on related topics:

- "Improving Client Stability with Proactive Problem Management"
- "Intel® vPro™ Technology: Proven Value in Four Use Cases"
- "Proactive PC Support Improves Service and Lowers TCO"
- "Reducing Client Incidents through Big Data Predictive Analytics"
- "Transforming PC Management with a Preventative Client Health Strategy"

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ACRONYMS

BI	business intelligence
BSOD	blue screen of death
CRM	customer relationship management
CMDB	configuration management database
KVM	keyboard-video-mouse
OOB	out of band
SSD	solid-state drive

For more information on Intel IT best practices, visit www.intel.com/IT.