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1. Introduction

Intel introduced Intel® Wireless Display for business (Intel Pro WiDi) in January 2015, in alignment with the 5th Generation Intel® Core™ processors launch. In order to ensure the successful introduction of ProWiDi, a Worldwide Proof of Concept (POC) was carried out, the goal of which was to gather feedback and gauge responses on how valuable the new technology would be in a business environment.

Toshiba is developing a strong focus on B2B, through their next generation 2015 mobile platforms such as the Tecra and Portégé product line and onus on technology and innovation. They share Intel's focus on User Experience and the No Wires strategy and thus were eager to take part in the POC.

With a range of devices built for business mobility, a widely compatible WiDi solution that enables users to connect quickly and easily is of high interest to Toshiba. They envisage environments where each user has the right PC for their job role, and all can connect in seconds, without the complication of wires.

Connecting business client PCs to HD displays in conference rooms creates a highly collaborative environment that streamlines meetings, simplifies communication and sharing and accelerates decisions. However, the fact is that consumer wireless display technologies are not compatible with the complex wireless networks in the majority of enterprises. Moreover, companies often have more stringent demands for data security and manageability than consumer solutions are capable of providing.

A WiDi solution specifically built for business, Intel® Pro Wireless Display (Intel® Pro WiDi) enables organizations to take advantage of WiDi in the workplace, with all the benefits of wirelessly connecting to projectors and displays co-existing with their enterprise networks, plus the security, flexibility, and configuration capabilities that IT requires. Intel® Pro WiDi is a step up from the Miracast™ industry standard and Intel WiDi and is compatible with Windows 7, 8.1 and 10, yet represents an inexpensive solution for businesses. New Ultrabook™ 2-in-1 systems, mobile PCs, and tablets with latest generation Intel® Core™ vPro™ processors and Intel® Pro WiDi have features designed to deliver a better experience for the user while meeting IT needs.
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Wireless connection to projector
There is a clear problem in that VGA ports are disappearing as devices get smaller. Moreover, I/O ports are often limited and dongles increasingly required. As a result of this, businesses are searching for a solution that complies with IT security requirements and is convenient, yet inexpensive at the same time. So what is that solution? A wireless display designed specifically for businesses: the Intel® Pro WiDi.

Productivity and Collaboration for Users
The Intel® Pro WiDi wirelessly connects to projectors and screens, using the WiFi radio already in your Intel vPro platform and third-party receivers such as the Actonitec® Screenbeam™ Pro WiDi receiver to retrofit existing screens or projectors. A specially designed meeting mode enables enhanced collaboration from participants, while there are built-in safeguards against the accidental display of sensitive content, including a reminder to disconnect when you leave the room and a filter to prevent the display of content in the wrong room.

Security and Manageability for IT
Importantly, the Intel® Pro WiDi allows the prevention of bridging between WiDi and corporate WLAN. The entire system can be managed remotely, with receiver settings configurable via LAN and client settings configurable via the Intel Proset software tools. Bandwidth and spectrum management is another of Intel® Pro WiDi’s strengths. The system is enhanced by Dynamic Frequency Selection (DFS) channel avoidance and Different Channel Mode (DCM) support, and benefits from bandwidth optimization for static images.

Intel’s “No Wires” Vision for Enterprise
Intel® Pro WiDi stands at the vanguard of current wireless display solutions. Yet this is just the beginning of Intel’s “No Wires” vision for enterprise. The next steps are wireless docking, WiGig docking solutions, and wireless charging, drawing on cutting-edge Magnetic Resonance Charging technology. The ultimate goal is to liberate enterprise from the restraints of cables, dongles and adapters and to enable fast, easy transitions between mobility and productivity.

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“The ability to connect wirelessly to a projector – using a range of different devices – will be of huge benefit to our users, as it allows them to collaborate quickly without complicated set-up, or the need for a specific port.”

2. USER BENEFIT
2.1 PRESENTER CONTROLS (MANAGED MEETINGS)

Managed Meetings Overview
As many conference room settings involve multiple wireless display client systems, Intel® Pro WiDi ensures a smooth, managed transition from one device to the next. The first Intel vPro client system to connect is designated as the meeting owner, while the other wireless display devices are meeting participants.

Managed Meetings offers three modes of connection to a display

“Pro WiDi is an example of technology that enhances collaboration, rather than getting in the way of it – even when using multiple wireless client systems.”

“Transition between presenters is seamless, something that’s vital in maintaining the flow of a meeting. We found that the user stayed in control at all times, and the speed at which the Pro WiDi receivers connected to our devices was impressive.”

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Only I present – In this mode, the initial connector is the only participant who can use the display, until they disconnect from the display or select a different mode.

Others can request to present – This mode allows any other participants to request control of the display once they have connected. The initial connector can then accept or reject this request.

I can request others to present – The final mode places the initial connector in the position of display moderator. They can then invite others (by computer name) to take control of the display. The moderator can also retake control of the display at any time.

Note: Two or more client systems will be required for a Managed Meeting.
2.2 Privacy

The USB back channel allows USB devices such as mouses and keyboards to connect wirelessly to the receiver. This was originally a feature of Miracast through the User Input Back Channel (UIBC). Intel developed the concept, producing the USB-over-IP (UoIP). This enables better compatibility and interoperability with Hardware Input Devices (HID), including multi-touch. The USB-over-IP feature currently only supports USB Human Interface Devices (HID) such as keyboards, mouses, game controllers and touch screens.

Intel® Pro WiDi uses a Privacy Screen, which requires users to verify their connection to a target projector or television before the system will allow their content to be displayed. This helps to prevent the projection of sensitive or private information onto a display in another conference room.

Intel® Pro WiDi also ensures that the presenter is aware that he or she is live. Moreover, the taskbar icon turns green to remind the presenter to disconnect when he or she leaves the conference room. This function is key to business collaboration, enhancing both the privacy and security of Intel Pro WiDi. They can then invite others (by computer name) to take control of the display. The moderator can also retake control of the display at any time.

“...The Privacy Screen adds an extra layer of reassurance for users, ensuring that they’re only sharing what they want to share at all times.”

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2.3 USB Back Channel

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Upon first connection to a wireless display session, the default display setting is to duplicate the laptop or laptop screen. A similar result is obtained when physically connecting a laptop to an external display. With the addition of a secondary display via the Intel® Pro WiDi session, you can use Windows commands such as Windows Logo Key + P to extend the display. To more easily switch between duplicate and extended display mode, an Intel WiDi Remote App is available on the desktop, allowing you to move quickly between both display modes with a single click. In extended display mode, the WiDi Remote App allows you to easily select the application you would like to show on the extended WiDi display.
Wireless connection to projector

A certified Intel® Pro WiDi receiver enables configuration of the device for conference room and complex WLAN environments. One immediately apparent particularity of the enterprise business environment is that multiple wireless infrastructure access points often exist across multiple wireless channels to ensure that mobile systems seemingly stay connected at all times. Unlike the consumer wireless environment, an enterprise wireless infrastructure has access to a larger number of wireless channels in the 5Ghz spectrum, including Dynamic Frequency Selection (DFS) channels, which are prohibited in a Direct WiFi usage model. The Intel® Pro WiDi solution accommodates these additional requirements by avoiding the use of DSF channels for wireless display.

A second important difference of the enterprise business environment is that multiple client devices can be connected to the wireless display receiver device at any given time. Instead of having to share the same wireless band and channel as the wireless infrastructure, the Intel® Pro WiDi solution for enterprise business environments enables the wireless display receiver to be the WiFi-Direct group owner, defining the channel to be commonly used by all Intel® Pro WiDi clients. This is commonly referred to as the Autonomous Group Owner (AGO). In this model, the client system must support Different Channel Mode (DCM) in order for two discussions on separate wireless channels to be possible.

Different Channel Mode (DCM)

The types of Miracast and Intel WiDi sessions commonly used in a consumer environment will share the same wireless band and channel used by the infrastructure. Often, a consumer environment has only one wireless access point with a designated channel. In contrast, business enterprise environments typically have a high number of wireless client devices associated to a single access point. Moreover, a larger-scale enterprise wireless environment will have multiple access points, utilize multiple wireless channels and even have access to wireless channels not available in the consumer wireless environment. Enterprise-only environments may include regulated channels in the 5Ghz band, which is known as Dynamic Frequency Selection (DFS). According to regulations, DFS channels are prohibited from being used for WiFi-Direct communications such as Miracast and Intel WiDi.

Due to increased wireless congestion and overall usage in enterprise environments – and in order to enable features such as Managed Meetings – the Intel® Pro WiDi enterprise solution supports Different Channel Mode (DCM). DCM allows the client device to maintain two wireless sessions on different channels.
3. IT FEATURES

**WiDi Channel Management**

In connection with DCM, the Pro WiDi receiver autonomously sets the wireless frequency and channel that clients must use when they connect to a particular wireless display receiver. This allows the IT organization to manage the volume of traffic on their infrastructure. IT can also set the channel bandwidth allocated to WiDi clients and receivers.

**3.2 SECURITY AND DEPLOYABILITY**

Due to the fact that Intel® Pro WiDi is a part of Intel® vPro™ technology, IT can also configure settings on PC clients to limit the WiFi-Direct connectivity solely to Intel® Pro WiDi-enabled displays. This reduces the risk of a laptop becoming a "soft access point" via which malware can infiltrate insecure peer-to-peer connections.

Further security enhancements include isolation between infrastructure (i.e. Wireless LAN) and WiFi-Direct (i.e. Wireless PAN) connections and ensuring that only wireless display communications occur during the WiFi-Direct session.

**PROSet App to configure and deploy client devices**

The Intel® Pro WiDi uses Intel PROSet to apply wireless display session security options. The Intel PROSet administrator tool can be used to implement a single PROSet package. Once this has been defined on the administrator or reference system, the resulting package can be applied to other client systems by running the saved, executable file on each client.

**3.3 LOCAL AND REMOTE MANAGEABILITY**

For enterprise customers, the efficient utilization of resources is an essential requirement. Being obliged to go from room to room in order to adjust settings is both inefficient and time-consuming. This is exacerbated by the fact that systems are often located in hard-to-reach areas (i.e. projectors fixed to the ceiling of a room).

Remote management is indispensable for most enterprise customers, and the fifth-generation Intel® Pro WiDi includes all the support necessary for this to be implemented successfully. Intel® Pro WiDi enables IT to configure wireless display network utilization and global policies on both client and receiver devices.

The Actiontec® Screenbeam™ Pro is the first certified Intel® Pro WiDi receiver, offering local management today and Remote Management later in 2015. Moreover, the launch of Actiontec is aligned with the fifth-generation Intel Core™ processor family launch.
It takes just three easy steps to realize the benefits of Intel® Pro WiDi in the workplace.

**Enable your PC fleet**
Look for mobile devices and Ultrabook systems with the latest generation Intel Core vPro processors, Intel® Graphics, and Intel® Wi-Fi modules, as these powerful platforms include support for Intel Pro WiDi.

**Enable conference and meeting rooms**
Look for certified Pro WiDi receivers to equip existing monitors and projectors with Intel® Pro WiDi.

**Configure your Intel® Pro WiDi devices for your wireless networks**
Set up wireless channels, limit bandwidth, configure each device name and set other parameters in order to foster a great user experience.

"Intel® Pro WiDi combines excellent security and privacy features with intuitive management."
"Implementing Intel® Pro WiDi was simple and fast – a shorter road to greater productivity."

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WiDi is a productive, inclusive technology for business users, and one that includes specific features to meet enterprise needs to be successfully deployed in the complex networks of large organizations. Intel® Pro WiDi provides an enterprise-grade WiDi solution designed for business and IT, including features for data privacy, network security, and local and remote manageability. Organizations interested in wireless display solutions should look for mobile devices such as the Toshiba Tecra and Portégé product line with the latest generation of Intel® Core™ vPro™ processors as well as monitors and displays with support for Intel® Pro WiDi.

www.toshiba.eu/widi
www.intel.com/prowidi

"Pro WiDi has the potential to become an integral part of our service offering. The ability to connect quickly, easily and wirelessly – using a range of different devices – is important to our vision for enterprise-sized businesses."

Toshiba
Intel technologies may require enabled hardware, specific software, or services activation. Check with your system manufacturer or retailer.

No computer can be absolute secure. Intel® Pro Wireless Display network security features require a system with an Intel® processor with vPro™ Technology, 1080p and Blu-Ray or other protected content playback, a compatible Intel® WiDi adapter and media player, and supporting Intel® WiDi software and graphics driver installed. Check with your device manufacturer. Learn more by visiting HYPERLINK “http://www.intel.com/go/widi”www.intel.com/go/widi.

Intel® vPro™ Technology requires setup and activation by a knowledgeable IT administrator. Availability of features and results will depend upon the setup and configuration of your hardware, software and IT environment. Learn more at: http://www.intel.com/technology/vpro.