

Remote Desktop Software that Supports Usability of Smart Devices

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Abstract

An increase in the introduction of enterprise based smart devices has been highlighting issues regarding their introduction, such as effective utilization of existing assets, inheritance of user interfaces and avoidance of the risk of information leaks. The Remote Desktop for Smart Devices is a software product designed to solve introduction issues by taking advantage of the three main features, which are Quick start, Easy to use and safety.

This paper describes the functions for implementing these three main features and discusses the prospective usage scenarios.

Keywords

smart devices, freedom from the need for development, asset utilization usability, security, BYOD, business system

1. Introduction

Prominent in the remarkable spread of smart devices, the introduction of tablet terminals in the business environment is particularly noticeable. It is expected that the number of such introductions will be as large as 1.4 million units in FY2016¹⁾ (about 8 times that of FY2011).

However, actual introductions usually encounter the following three issues.

- **Effective utilization of existing assets**
A mechanism is required that allows existing business systems and applications to be run on smart devices without a need for new development.
- **Inheritance of user interfaces**
A mechanism for enabling the same control method as for the traditional PC is also required in addition to the control that is proper to the smart devices.
- **Avoidance of risks of information leaks**
A mechanism is required for assuring security, even for personally-possessioned smart devices.

To solve these issues, NEC System Technologies has developed the Remote Desktop for Smart Devices. This is a product (hereafter referred to as “this product”) for use in connecting and using a corporate business system from a smart device while taking advantage of its three main features of Quick start, Easy to use and safety.

This paper describes the functions implementing the three

main features of this product in sections 2 to 4 and discuss the prospective scenarios for which use of this product are assumed.

2. Functions Implementing Quick Start

This product implements Quick start via its simple system installation facility and the remote desktop function that allows existing Windows business applications to be run on smart devices without providing any modification or new development.

The remote desktop function makes it possible to control the desktop of a PC from a remote location. This product implements the remote desktop function by simply installing the software in the smart device (**Fig. 1**). After installation of this

- The system configuration enables business applications to be operated on a smart device via a PC in the office (Direct access to a business application server is also available.)

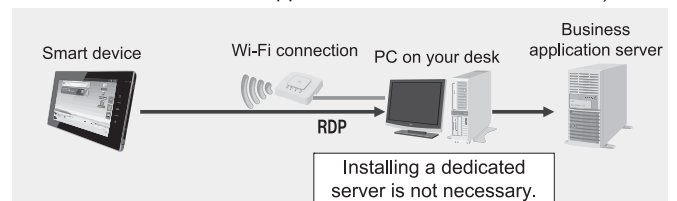


Fig. 1 System configuration (Simple introduction pattern).

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product in a smart device, it can immediately connect to a PC in the office and control it. There is no need to install not only a dedicated server but also server modules or middleware in the PC.

The remote desktop function is composed of the following three elements.

(1) Remote Desktop Client

This is the software provided by this product that enables it to run on a smart device. It connects to a PC, displays the desktop and provides the mouse/keyboard functions of a PC by means of its software. An external mouse and keyboard can also be used.

(2) Remote Desktop Service

This software runs on a PC. Upon reception of a connection request from the Remote Desktop Client, it sends the information on the desktop. It also receives control information such as the mouse operation and keyboard input and hands it to an application running on the PC. This product utilizes only those functions provided as standard with Microsoft Windows, so that there is no need to add software to the PC or dedicated hardware, such as a network appliance server.

(3) Remote Desktop Protocol (RDP)

This is the communication protocol between the Remote Desktop Client and the Remote Desktop Service.

This product adopts the Microsoft RDP protocol.

The remote desktop function allows a smart device to use Windows applications immediately. It is not necessary to rewrite existing business applications for the smart devices. The possibility of effective utilization of existing business applications assets allows the user enterprise to improve added value. For example, by allocating investment for the development of a new catalogue application for face-to-face sales, thereby making full use of the easy-to-use user interfaces of smart devices.

3. Functions Implementing Easy to Use

This product can control a remote desktop using the gestures proper to smart devices such as pinch-in, pinch-out and flick. In addition, it also facilitates the PC-proper operations that are usually hard to control with smart devices, such as the mouse and keyboard operations, by developing a unique user interface (Fig. 2).

(1) Transparent buttons (patent applied for)

These semitransparent buttons correspond to the

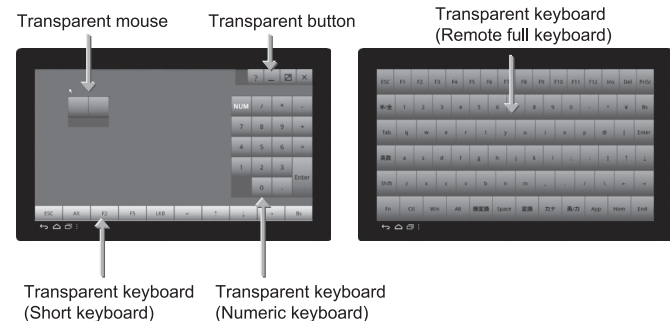


Fig. 2 User interface.

Maximize, Minimize and Close buttons at the top right corner of the window displays of Windows applications. Although these buttons are frequently used in the control of Windows, they would be too small to be pressed when they are displayed on the smart device screen. So we have created buttons that are enlarged into easy-to-press sizes and placed them on the screen. They will not hinder operation because they provide background view thanks to their transparency and they may also be moved to a required location.

(2) Transparent mouse (patent applied for)

A software-based transparent 2-button mouse can be displayed on the screen whenever necessary. Clicking on a desktop icon or scrolling of the display is possible with finger touch without using the mouse, certain operations such as changing the cell width of spreadsheet software and control of the drawing tool of presentation software are hard to accomplish with finger touch, because the control targets are small and they are hidden by the fingertip. The transparent mouse is designed for use in such cases. The transparent mouse features an extendible mouse cursor that reaches near to the corners of the screen to facilitate control in these locations.

(3) Transparent keyboard (patent applied for)

This device is a software keyboard that facilitates control of the remote desktop. When running spreadsheet software on a PC for example, the arrow keys are used frequently. Also, business applications often use the Tab, Shift + Tab, Enter and Shift + Enter keys for moving across the displayed input boxes. However, these keys are not provided in the keyboard used as standard in ordinary smart devices. This product provides the following software keyboards to facilitate control of Windows applications from the smart device.

- Short keyboard: This keyboard collects the keys used frequently in the control of business applications and for editing character strings and arranges them in a line at the bottom of the screen.
- Numeric keyboard: This keyboard combines the ten numeric keys and arrow keys to facilitate the use of spreadsheet software.
- Remote full keyboard: This is a full keyboard offering keys equivalent to a Japanese 109-key keyboard. It accepts the combination key inputs.

All of the software keyboards are transparent, offering a view of the display below the keyboard. While the keyboards of ordinary smart devices are displayed on the bottom half of the screen and sometimes hide the input target display, the transparent display makes it possible to confirm the target display during input.

(4) Fusion of finger touch gestures and Windows control

This product can scroll the Windows application displays by using finger touch as the mouse wheel operations. In general the Windows operating system supports finger touch control since Windows 8. This product enables control of windows using smart device-proper operations that combine finger touch gestures such as Tap, flick, drag and pinch even with Windows XP and Windows 7.

4. Functions Implementing Safety

The smart devices feature excellent portability even when they are compared to the notebook PCs, they are thereby expected to be applied actively outside offices. On the other hand, however, such use also leads to the risk of losing a smart device that contains important business data or to the theft of data by a malicious user. Since the use of smart devices is being adopted very rapidly, the malware countermeasures for corporate use are not yet well established compared to those for the PC. In addition, as the use of privately owned terminals in business (BYOD; Bring You Own Device) is becoming a trend, it is expected that the management of smart devices connected to corporate systems will become very complicated.

In general, the use of a remote desktop does not cause the actual data to be stored in the smart device even when the handled data is identical to that used by the PC in the office. Disconnecting the remote desktop connection clears the displayed data from the smart device, so the risk of an informa-

tion leak can be regarded as being small from this aspect.

To promote safer use of smart devices in business, this product is provided with the following five security enhancement features.

(1) Inhibition of file downloading

The remote desktop function usually includes a facility for transferring files to the terminal as standard, but this facility cannot be used with this product.

(2) Inhibition of local clipboard linkage

The smart device cannot exchange the clipboard data with remote PCs .

(3) Inhibition of local printing

Data from the remote desktop is not enabled to be output at the local printer of the smart device.

(4) Freedom from care against key logger malware

The unique transparent keyboards send the key information directly to the remote desktop. Even if the smart device is infected by key logger type malware, the key input data will not be extracted when the transparent keyboards of this product are used.

(5) Impossibility of startup in debug mode

When a smart device set to the debug mode is connected to a development environment, the operation information of the software running on the smart device can be extracted. However, this product cannot be launched when the smart device is in the debug mode, so the extraction of information can thereby be prevented.

5. Prospective Usage Scenarios

This product allows a single smart device to be used as two terminals, including the use of dedicated applications of the smart device and the outside use of a PC.

For example, the use of a smart device-dedicated application with high operability is recommended in face-to-face sales talk. When inquiry of the inventory is required, the same smart device can be used to access an existing business application. This usage makes it possible to use existing business applications just as on the PC in the office without the need of re-developing them into ones that are specifically for smart devices (Fig. 3).

It is also effective to use a smart device exclusively as a substitute for a mobile PC. If you currently use two PCs including a desktop PC for use in the office and a mobile notebook PC for use outside the office, replacing the mobile

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- A single smart device can be used as two terminals, such as for a dedicated sales device as well as for a mobile PC.
 - A salesman approaches a face-to-face deal with a customer by displaying a product catalog on a smart device. The "Remote Desktop" allows the salesman to connect to PCs in the office and to check inventories via a smart device.
 - Microsoft Office, mailing software and scheduler software, etc. can be operated on a smart device while travelling.

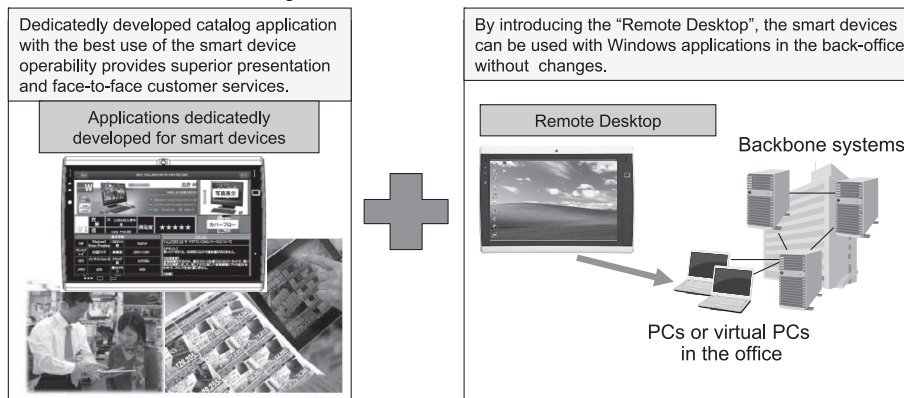


Fig. 3 Prospective usage scenarios.

notebook PC with a smart device makes it possible to reduce the weight by less than a half*¹ and the thickness by less than 1/3rd*².

6. Conclusion

The Remote Desktop for Smart Devices makes it possible to apply the latest hardware technologies, communication technologies and the high cost efficiencies of smart devices in corporate businesses easily, safely and at low cost. Adoption of the device is expected to accelerate the use of smart devices by enterprises.

*Windows is a registered trademark of Microsoft Corporation in the U.S. and other countries.
 *Wi-Fi is a registered trademark of Wi-Fi Alliance.

Reference

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*¹ If an UltraLite type VB (1.2 kg) is replaced by the Lifetouch L (0.5 kg).
 *² If an UltraLite type VB (29.5 mm) is replaced by the Lifetouch L (7.9 mm).

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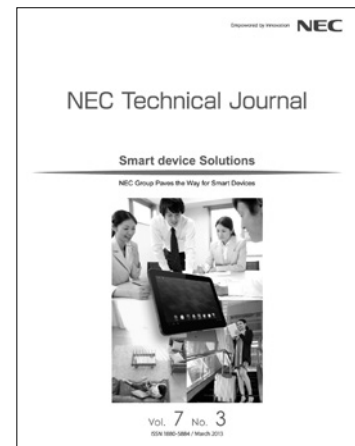
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