

# Overall Perspectives of SkyPDF Product Group, Achievers of Secure Printing and Scanning

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Document security solutions, such as secure printing and scanning of documents, have become essential due to the enforcement of the Personal Information Protection Law and the e-Document Law. Furthermore, a Japanese version of the Sarbanes-Oxley Act is expected to be enforced starting from March of 2008, when it will be essential for corporations to organize internal control.

SkyPDF™<sup>\*1</sup>), with a history for selling 850,000 licenses within a year since its release, on the other hand, has been accepted by the market as a product incorporating PDF, which is at the core of high speed electronic document solutions, with high quality and for a low cost.

This paper will introduce an overall image of the SkyPDF product group, which is currently drawing a lot of attention in the industry for its capacity to offer powerful support relating to the output, storing and monitoring of documents, as well as the input of paper documents.

## Compliance of e-Document Law

The e-Document Law was enforced in April of 2005 after improvements were made to laws and regulations implemented by numerous government ministries and agencies, as a policy of the e-Japan Strategy to promote the adoption of IT by private sector entities (Table 1).

Table 1 Laws and regulations subject to e-Document Law

Cabinet Office	3	Ministry of Education, Culture, Sports, Science and Technology	12
National Police Agency	11	Ministry of Health, Labour and Welfare	67
Financial Services Agency	28	Ministry of Agriculture, Forestry and Fisheries	31
Ministry of Internal Affairs and Communications	10	Ministry of Economy, Trade and Industry	43
Ministry of Justice	21	Ministry of Land, Infrastructure and Transport	41
Ministry of Foreign Affairs	2	Ministry of the Environment	11
Ministry of Finance	16	Total	296
		[Non-redundant total]	[251]

Source: e-Document Initiative: Policy for Drafting e-Document Law [Points]

In order to realize electronic documents that comply with the e-Document Law, the following functions are required (Figure 1):

- (1) Paper document input: Electronic conversion of documents by scanning.
- (2) Electronic signature: Evidence to indicate no tampering.
- (3) Electronic signature verification: Verification to ensure no tampering exists.
- (4) Time stamping: Evidence to indicate temporal existence of documents.

\*1) SkyPDF is a trademark of SkyCom Corporation.

SkyPDF Tools is a product developed to realize these functions and is equipped with the functions listed under items (1) to (4) (Figure 2).

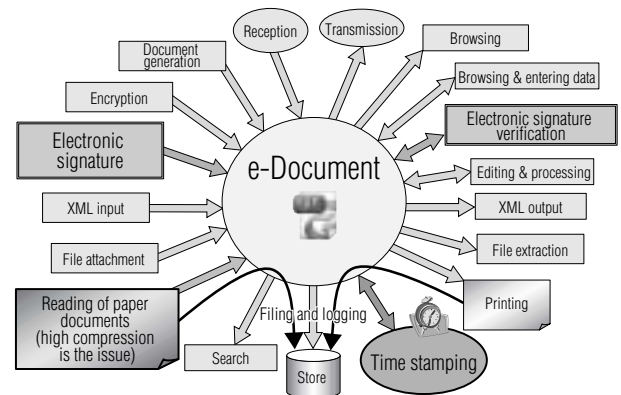


Fig. 1 Essential functions for compliance of e-Document Law

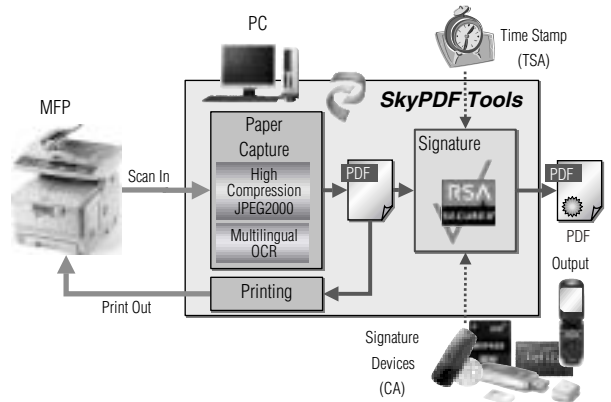


Fig. 2 Paper document input, as well as electronic signature and time stamping

SkyPDF Tools offer as basic functions the ability to browse and display PDF files, as well as input paper documents and it can also implement electronic signatures. The product supports a wide range of electronic signature formats and can be used to implement signatures on IC cards with electronic certificates issued by private sector certificate authorities, basic resident register cards with public electronic certificates installed, as well as certificates issued by the FirstPass service of FOMA for mobile phones.

Furthermore, since it is also capable of implementing signatures in the form of time stamps, which are domestically serviced, all functions necessary to generate documents that comply with the e-Document Law are available.

The algorithm with the highest current compression standard available for PDF, JPEG2000, is supported for the input of paper documents. Compression rates attained are four to ten times those of conventional JPEG in terms of generated document sizes.

**Compliance for Personal Information Protection Law**

Enforcement of the Personal Information Protection Law took effect in April 2005.

In order to prevent information leaks, the assignment of controls for the right to browse, print, copy & paste and other such operations become essential for generating document files. It is for this purpose that the Information Rights Management (IRM), made available by the Rights Management Service (RMS) of Microsoft, was adopted for the infrastructure (Figure 3).

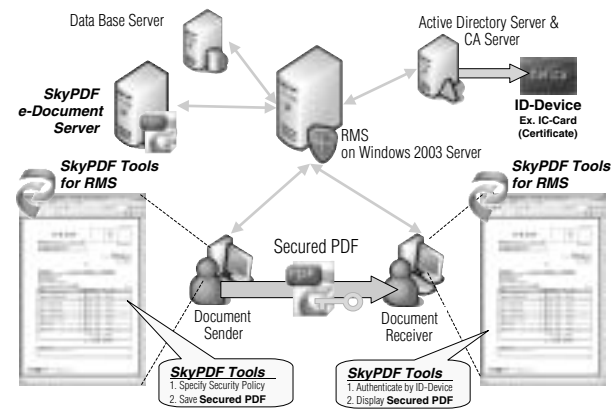


Fig. 3 Support for RMS and IRM.

The RMS and IRM are equipped with Office® 2003 Professional (including Word®, Excel® and PowerPoint®)\*2, making it possible to prevent information leaks from documents prepared by these software. By supporting RMS and IRM, it is possible to apply policies at the same level of security as those applied to documents prepared by Office applications on PDF files as well, which we believe offer a high degree of convenience.

The right to permit browsing, printing, copy & paste and such other functions is assigned when saving a PDF document read by the SkyPDF Tools to support RMS with SkyPDF Tools.

The PDF file assigned with these rights is encrypted and, therefore, indecipherable even if leaked.

Users who are permitted to browse the document are allowed to view the document only in the environment wherein access to the RMS is possible. This is realized by linking the Active Directory server that authenticates the users and the RMS that controls the access rights (Figure 4).

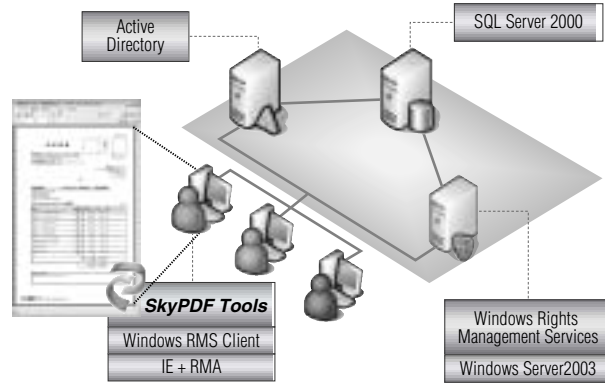


Fig. 4 Configuration of system supporting RMS

**Realization of Secure Printing and Scanning**

Secure printing and scanning are realized, based on the SkyPDF Tools and RMS described thus far.

**(1) Secure Printing**

SkyPDF Pro is selected as the print output function for Office documents to generate PDF files, while the rights are assigned using the SkyPDF Tools during the print preview.

Such a PDF file is spooled by the SkyPDF e-Document Server. Printing, however, will not be performed unless the user who is assigned the printing rights is authenticated with an IC card or by other means on a printer or an MFP. Data of the PDF file is sent to a printer or an MFP from the e-Document Server only after the user who has been assigned the printing rights is authenticated. The person receiving the output printing on paper can be specified (Figure 5).

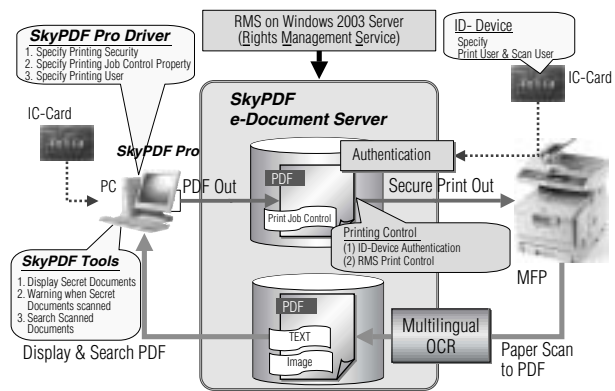


Fig. 5 Secure printing and scanning

**(2) Secure Scanning**

Similar to printing, paper documents will not be scanned unless a scanner or an MFP authenticates the user.

The information regarding “who scanned the document?” is assigned to the PDF file and the contents are converted into text data by OCR during scanning,

\*2) Office® 2003, Word®, Excel® and PowerPoint® are registered trademarks of Microsoft Corporation in the United States and other countries.

which takes place after user authentication has been completed. Since it is possible to monitor the contents converted into text, the registration of the term "Proprietary" for example, makes it possible to have notifications issued to administrators when such keywords are detected (Figure 5).

This type of user authentication and assignment of rights can be performed using the ActiveDirectory and RMS, making it possible to operate systems with consistent security policies (Figure 5).

### Use in MetaFrame<sup>\*3)</sup> Environments

Conversion to Thin Clients is drawing a lot of attention as an effective means for preventing information leaks. MetaFrame is a representative platform for Thin Clients and the SkyPDF e-Printer Enterprise we developed supports this MetaFrame.

A major issue of the MetaFrame environment is remote printing by Thin Clients. A variety of remote printing solutions are available, with the most recent version of MetaFrame equipped with a remote printing function that is based on the EMF.

We were successful in increasing the processing of remote printing to high speeds by taking advantage of the characteristics of SkyPDF, which include high compression rates through JPEG2000 (Figure 6).

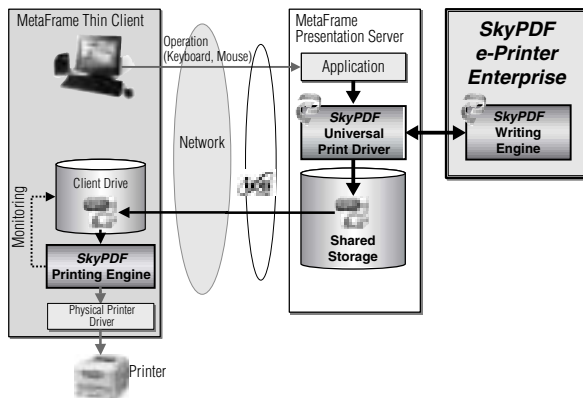


Fig. 6 Remote printing with MetaFrame

With our benchmark we were able to accelerate the printing to high speeds that reach approximately three to five times that of Word and Excel while the rate for PowerPoint was faster by five to ten or more times when printing files via PDF conversion, in comparison with printing via the EMF, with which the MetaFrame is equipped as a standard provision. The acceleration of remote printing to high speeds can inhibit the cost of the operating communications infrastructure and can be considered particularly effective for remote printing by mobile Thin Clients, users of which have increased in number recently.

### Balancing Securing and Simplifying Workflow

The circulation and distribution of electronic documents, such as PDF files, are currently being conducted primarily via electronic mail.

The current issues with regards to electronic mail that prevent the popularization of the workflow for electronic documents include the following:

- (1) Email addresses must be assigned each time, which makes the process complicated.
- (2) There is no way of verifying whether sent documents have been delivered to the receiving parties.
- (3) It is not possible to UNDO erroneous transmissions.
- (4) There are no effective means to prevent the reception of spam mail.

In order to resolve these issues relating to electronic mail, it is necessary to establish a new mechanism for distributing electronic documents. We developed a product to provide just that and called it an e-Document Router, with the product name SkyEDR<sup>TM\*4)</sup> (Figure 7).

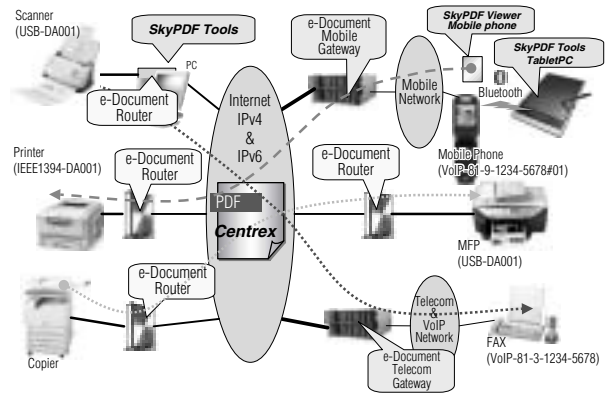


Fig. 7 SkyEDR

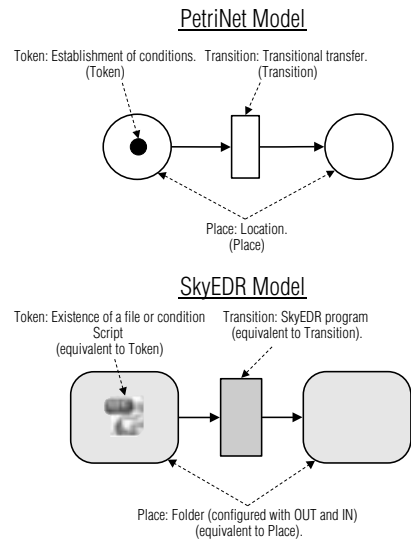


Fig. 8 Operating principle model for SkyEDR

\*3) MetaFrame is a registered trademark or trademark of Citrix in the United States and other countries.

\*4) SkyEDR is a trademark of SkyCom Corporation.

A simple PetriNet model has been adopted as the operating principle for the SkyEDR (Figure 8).

The Token corresponds to the PDF file, while Place corresponds to the document folder and the Transition to programs, such as the SkyEDR or SkyPDF Tools.

The operating principle is extremely simple, namely, the Transition is ignited (program is booted) when conditions for starting the program have been satisfied and the Token is transitioned to the next Place (Figure 9).

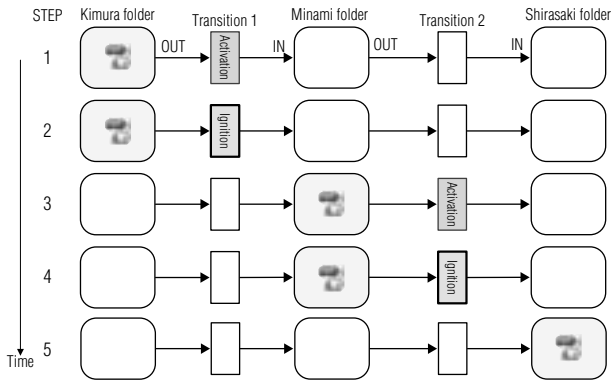


Fig. 9 Example of simple workflow

Options are available for setting workflows that are a little more complex, thereby making it possible to conduct operations, such as reversions.

When multiple Transitions are set from a Place, the SkyEDR automatically displays a Selection dialog. When there are no options, the Token transitions automatically to the next Place (Figure 10).

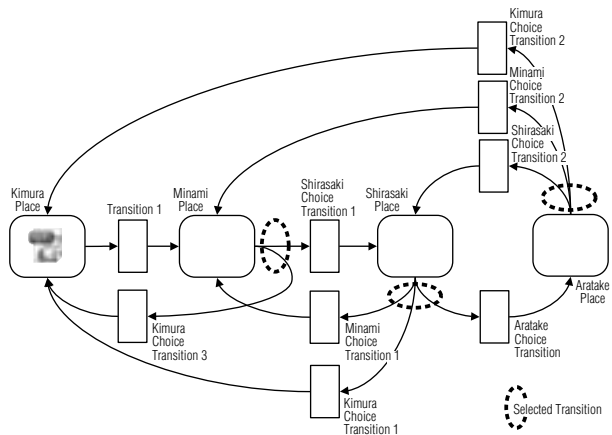


Fig. 10 Example of selectable workflow

### Utilization of Combined SkyPDF Product Groups

It is possible to build a robust secure printing and scanning system by combining the SkyPDF product groups described thus far (Figure 11).

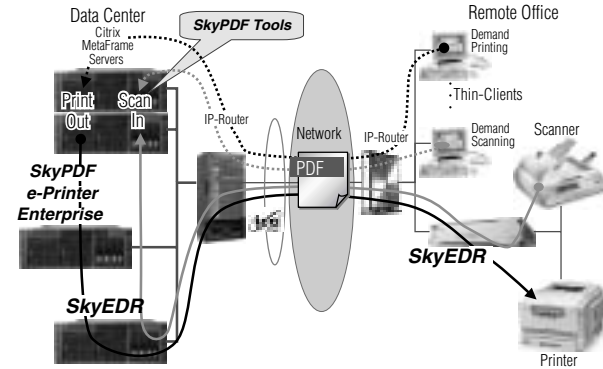


Fig. 11 Example of utilized SkyPDF product groups combined

### Conclusion

SkyCom is trying rigorously to make a complete array of products available in order to respond to the rapidly increasing needs for securing electronic documents. We invite you to evaluate our software, by the SkyPDF product group and utilize it as components for your secure electronic document solutions.

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