XEROX PRINTER FIRMWARE AND UPDATES

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This is the fifth in our series of newsletters on printer firmware and updates. In previous editions, we noted that our industry continues to experience "OEM Firmware Updates" and the (at times) disastrous results on replacement chip functionality. Earlier, we covered HP, Samsung, Okidata, and Lexmark firmware; this edition will review Xerox.

Only a small portion of the firmware actually deals with the communication between printer and chip. The basic function of the chip is to present cartridge (on which the chip is mounted) information to the printer, and if correct, printing is allowed. This includes information such as:

- The correct cartridge info (part #)
- Correct region
- Cartridge new or used
- If used, the page-count and page coverage
- Toner remaining in the cartridge (based on information stored by the printer)

"Chips" on toner cartridges have evolved significantly since the first versions that appeared on Xerox cartridges in the late 1990s. Industry veterans will recall the first error messages for "CRUM" (Consumer Replaceable Unit Monitor, Xerox-speak for cartridge chip). These simple chips were readily programmed and replaced by the aftermarket. When introduced, the machines used the chips to store the usage history on an installed cartridge. Aftermarket chip manufacturers were also quick to market resetters to make the spent chips re-usable.

Notably, Xerox introduced different regions for printer/cartridge combinations. Although the cartridges were identical, regional information on the chips prevented cross-regional cartridge usage (cartridge prices do vary from region to region). This regionalization has become popular with other OEMs as well.

Multiple regions mean development of multiple chips to cover the different regions. While not necessarily complex, it adds to development time for aftermarket chips. In addition, chip architecture became more complex as the OEMs strived to block or hinder aftermarket development. The use of higher-level encryption and proprietary chip architecture further increased development time and product cost.

Xerox has not been particularly aggressive in implementing firmware changes to block aftermarket chips, but ANY firmware change must be reviewed to determine impact on existing product. Xerox, like many OEMs, offers machines based on engines from, or in collaboration with, other OEMs, including Epson, Minolta, Sagem, Samsung and Sharp. Firmware changes on these OEM machines may "trickle down" into the Xerox versions and cause unforeseen problems.

A good example is the Xerox 3100 series (Sagem engine). When introduced, installing a replacement cartridge required insertion of a "Smartcard" to register the cartridge with the machine. The smartcards were not exceptionally unique, and the machine did not care or store the serial number of any prior smartcard used. Aftermarket chip manufacturers were quick to market with replacement cards.

Sagem released a series of firmware updates, forcing the machines to query the smartcards for special keys and serial numbers, and allow printing ONLY IF the response from the card was received within a very short time window (a fraction of the original time). While this temporarily blocked aftermarket cards, it also blocked some OEM cards as well, resulting in several additional firmware releases to correct the problem. This did not help the marketability of these machines, and by implementing the firmware, Xerox was caught with an otherwise good product that no one wanted because of the issues.

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Constant monitoring of firmware update availability is critical. UniNet routinely reviews OEM sites for updates on key products by machine, and by region. Of these major OEMs, firmware update monitoring is top priority:

- Lexmark - has historic track record of firmware updates impacting chip functionality.
- Samsung - increasing use of firmware updates to block replacement chips.
- Xerox - firmware updates may or may not include blocking replacement chips.
- HP - firmware updates rarely impact aftermarket chips, but functionality issues of “Genuine HP” vs. “Non HP” are being addressed via updates as they are encountered.
- Dell - usually follows Lexmark, but more regionalization has increased complexity.

This month, the featured OEM firmware listing is for Xerox. As shown in the list below, Xerox has released a number of firmware updates since January 1, 2014.

MACHINE SERIES	REGION	FIRMWARE	DATE RELEASED
Xerox Phaser 3635 MFP	WW	20.105.01.010	16-Jan-14
Xerox WorkCentre 3550	EU	25.003.03.000	10-Feb-14
Xerox Color 560/550 MFP	AS	55.40.61	12-Feb-14
Xerox Color 560/550 MFP	AS	55.40.61	12-Feb-14
Xerox Phaser 3320	CA	V53.005.00.000	20-Jun-14
Xerox WorkCentre 3325	CA	51.005.01.000	21-Jun-14
Xerox WorkCentre 3315/3325	AF	51.005.01.000	21-Jun-14
Xerox Phaser 7100	CA	17.20.31	23-Jun-14
Xerox Phaser 6600/WorkCentre 6605	AF	201407180655	28-Jul-14
Xerox Phaser 3610/WorkCentre 3615	CA	5.34.00	28-Jul-14
Xerox WorkCentre 7525/7530/7535/7545/7556	ME	061.121.224.18803	03-Nov-14
Xerox WorkCentre 7525/7530/7535/7540/7545/7556	WW	061.121.224.18803	03-Nov-14
Xerox Phaser 6500/WorkCentre 6505	CA	201411101221	18-Dec-14

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