



NetQin Mobile Anti-Virus White Paper

1. Security challenges to smart phones

With the development of technology and user's requirement, the percentage of smart phones is increasing rapidly. According to the statistics of CCID, the shipment of smart phones in 2006 is 30 millions in China, and will be 60~80 millions in 2007.

While traditional mobile phone can only deal with voice communication, smart phone is a much more powerful terminal which can fulfill multimedia communication, entertainment and even business transactions. More and more personal and business data will be stored in smart phone. Therefore, the security of smart phone becomes very important. Since the first proof-of-concept virus Cabir's appearance in June 2004, at least 2 new types of virus have had being come into known every single week. There are nearly 200 different types of virus in smart phone until today.

Hence, the situation is very critical and it is urgent to provide an effective security solution to the users of smart phones. There are four main types of operating system in smart phone, Symbian, Windows Mobile, Linux and Palm OS. Since Symbian has occupied the biggest market share and becomes the main target of malware designers. Currently we provide solutions on Symbian and Windows Mobile. Other version of solution (for Linux, Palm OS) will be provided in the near future.

2. Mobile anti-virus technologies

2.1 Scanning

The task of scanning is to check all the files for virus. One major problem to be solved in scanning is the scalability. Scalability is the ability to deal with the increasing number of viruses, to retain the scanning speed even when the number of infected files is increased. It is very important for smart phone because it has limited process power, storage and battery life.

2.2 Real-time monitoring

In order to keep the smart phone away from virus, it is highly important to detect



the virus when it tries to enter the smart phone, which is the task of real-time monitoring. Real-time monitoring runs as a daemon application. When a message try to enter the smart phone or a new file is created in the smart phone, real-time monitoring start to scan the message or file. So with real-time monitoring switched on, the smart phone can communicate with outside safely.

2.3 Disinfection

Users usually store some important private or business data in their smart phones. When these data are infected by viruses, users do not want they data to be simply deleted. Or when some software downloaded from networks is infected by virus, users also want to be able to install the original software. Therefore, it is very important to remove the virus from such files and keep the files still usable, which is also called disinfection.

2.4 Updating

There are two kinds of updating, virus definition updating and system updating. It can be fulfilled through many ways, such as GPRS, SMS, MMS, and so on.

1. Virus definition updating

As to anti-virus software, the number of different kinds of viruses is critical for the security of system. It is a basic requirement to keep the virus definition database up to date. One approach is to schedule the updating periodically.

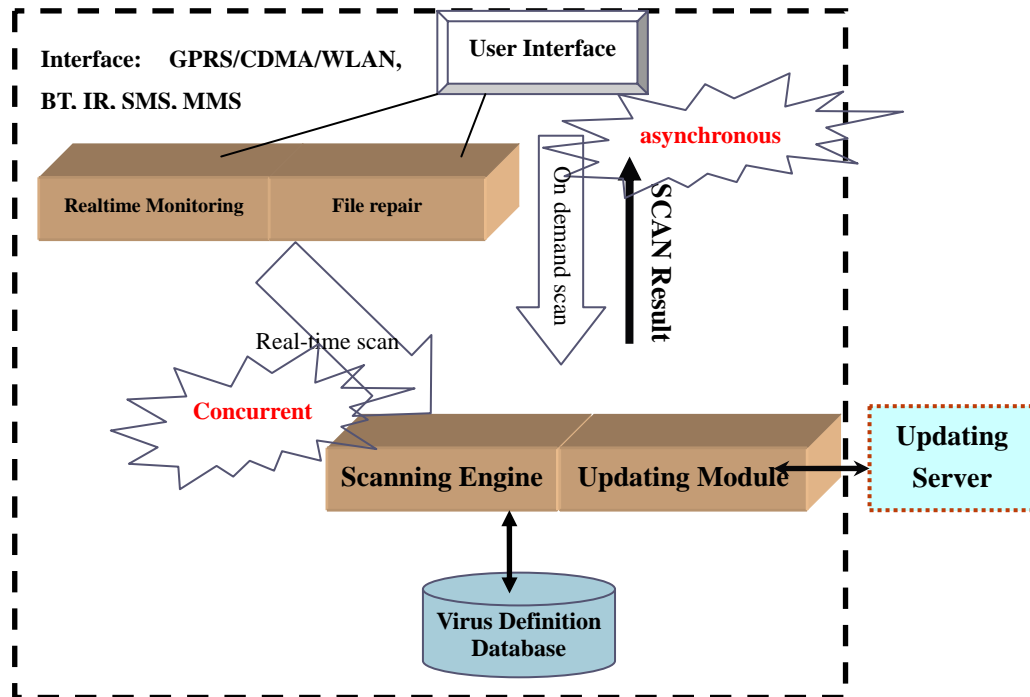
2. System updating

Scanning engine and other components of anti-virus software may also need to be upgraded when newer engine or components are developed. Newer engine or components are delivered to the user on air.



3. Architecture of NetQin Anti-virus

The architecture of NetQin anti-virus is shown in the following figure.



There are six modules in the architecture, which are presented as follows:

- User Interface: to interact with user friendly.
- Real-time Monitoring Module: to monitor all the interfaces (including Bluetooth, Infrared, SMS, MMS, GPRS and so on) of the smart phone, and prevent the virus from intruding the system through these interfaces.
- Scanning Engine: to fulfill effective and fast scanning through pattern match. Other modules can concurrently request to scan a file in asynchronous mode. Scanning Engine then decides the scanning order according to the priority of the requesters. After finishing the scanning, Scanning Engine returns the result to corresponding modules.
- Disinfection Module: to locate the position of virus with the help of Scanning Engine, and then remove it from the normal file.
- Updating Module: to update the virus definition database and components through versatile ways, such as SMS, MMS, GPRS and so on.
- Virus definition database: to store the virus definition efficiently for Scanning



Engine. It is updated by Updating Module.

4. Compatible smart phones

Our solution on Symbian is for Series 60 and UIQ platform. Phones that are supported by NetQin Mobile Anti-Virus are as follows.

OS	Platform	Model
Symbian OS v6.1	Series 60 1 st Edition	Nokia 3600 Nokia 3620 Nokia 3650 Nokia 3660 Nokia 7650 Nokia N-Gage QD Nokia N-Gage Siemens SX1 Sendo X
Symbian OS 7.0s	Series 60 2 nd Edition	Nokia 6600
Symbian OS 7.0s	Series 60 2 nd Edition, Feature Pack 1	Nokia 3230 Nokia 6260 Nokia 6620 Nokia 6670 Nokia 7610 Panasonic X700 Panasonic X800 Samsung SGH - D700 Samsung SGH - D720 Samsung SGH - D728 Samsung SGH - D730
Symbian OS 8.0a	Series 60 2 nd Edition, Feature Pack 2	Nokia 6630 Nokia 6680 Nokia 6681 Nokia 6632 Lenovo P930
Symbian OS 8.1a	Series 60 2 nd Edition, Feature Pack 3	Nokia N70 Nokia N72 Nokia N90 Samsung SGH-Z600
		Nokia N73 Nokia N71 Nokia N80 Nokia N91



Symbian OS 9.1	Series 60 3rd Edition	Nokia N92 Nokia N93 Nokia E60 Nokia E61 Nokia E62 Nokia E65 Nokia E70 Nokia 3250 Nokia 3250XM Nokia E50 Nokia N83 Nokia 5500 sport Nokia N75 Nokia 6290
Symbian OS v7.0s	UIQ 2.1	Nokia 6708 Sony Ericsson P800 Sony Ericsson P802c Sony Ericsson P908 Sony Ericsson P900 Sony Ericsson P910c Motorola A920 Motorola A925 Motorola A1000 Motorola A1010 Motorola FOMA M1000 BenQ P30 BenQ P31 Arima U300 Arima U308 Arima ASP805

Our solution on Windows Mobile supports the following models of smart phone.

OS	Model
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Windows Mobile 2003 for Pocket PC	Dopod 696 Dopod 696i Dopod 700 Panda E88 Lenovo ET280 Lenovo ET560 Daxian CU928 E-TEN E88 E-TEN P300 E-TEN P300B HP iPAQ H6315 HP iPAQ 6365 MoviStar TSM500 O2 XDA II
Windows Mobile 2003 Second Edition for Pocket PC	Dopod 699 Dopod 818 Dopod 828 Dopod 828+ Panda E88+ Benq P50 Motorola MPX ASUS P505 HP iPAQ HW6500 HP iPAQ HW6515 E-TEN M300 E-TEN M500 E-TEN E88+ Lenovo ET960 Qtek S110 I-Mate JAM Samsung SGH-i700
Windows Mobile 5.0 for Pocket PC	Dopod 818pro Dopod 830 Dopod 838 Dopod 900 Dopod Muse Lenovo ET980 HP iPAQ RW6818 HP iPAQ RW6828 HP iPAQ HW6940 HP iPAQ HW6945 HP iPAQ HW6965 GIGABYTE g-Smart



	GIGABYTE g-Smart i Motorola Q ASUS P525 Aimo E800 Aimo E850 OKWAP K868 E-TEN G500 E-TEN G50+ E-TEN M550 E-TEN M600 E-TEN M600+ Cingular 8125 Fujitsu LOOX T810 HTC TyTN i-mate K-JAM i-mate JASJAR i-mate JAMin Qtek 9100 Qtek 9000 Qtek S200 Qtek V1640 T-Mobile MDA T-Mobile Compact II T-Mobile Vario T-Mobile Vario II T-Mobile MDA Pro O2 XDA Mini S O2 XDA NEO O2 XDA ATOM Orange SPV M3100 Orange SPV M5000 Orange SPV M600 Palm Treo 700W UBiQUiO 401 UBiQUiO 501
Windows Mobile 2003 for Smartphone	Dopod515 Dopod535 MotorolaMPx100 MotorolaMPX200 Qtek8060 Qtek8080 i-mateSmartphone2 SierraWirelessVoqSmartphone



	SprintSPH-i600 TCLe777 VerizonSCH-i600
Windows Mobile 2003 Second Edition for Smartphone	AudiovoxSMT5600 AudiovoxSMT5600 Dopod565 Dopod568 Dopod575 Dopod585 i-mateSP3 i-mateSP3i MotorolaMPx220 Motorolai930 O2XphoneII O2XphoneII m OrangeSPVC500 OrangeSPVC500S PantechPH-S8000T Qtek8010 Qtek8020 Qtek8100 Qtek8200 RoverPCM1 SAMSUNGMITsSCH-M600 SAMSUNGSGH-i300 SAMSUNGSGH-i300x T-MobileSDA T-mobileSDAII T-MobileSDAMusic
Windows Mobile 5.0 for Smartphone	AMOIE70 Cingular2125 Cingular3125 Dopod577W Dopod586W Dopod595 Dopod596 Dopod710/S300/S301 HTCMTeoR iMateSmartflip iMateSPJAS iMateSP5 iMateSP5m iMateSPL



	O2XDAIQ O2XDAPhone O2XDAGraphite OrangeSPVC600 Qtek8300 Qtek8500 Qtek8310 SAMSUNGSGH-i308x SAMSUNGSGH-i310 VodafoneVDAIL VodafoneV1240
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5. Brief introduction of NetQin Tech. Co., Ltd.

NetQin Tech. Co., Ltd. is a high-tech enterprise in Beijing, which is set up by a group of first class experts, management team and tactical investors. NetQin focuses on mobile security and intelligent information service, to provide intelligent and dependable mobile information service. Our products include anti-virus for mobile/intelligent terminals, firewall/waterwall for mobile/intelligent terminals, mobile network filter and blacklist report systems, intelligent integrated platforms for mobile value added service, and so on. Our products serve a huge number of mobile users and telecom and mobile enterprises as well.