

# Mobile office opportunities

A way to tap the underserved business segment and to boost data usage

## Introduction

Stimulating usage of non voice service and thereby increasing ARPU is operators' key challenge in today's mature mobile markets. In this context, it is exceptionally important to improve the offering – and thus the usage – in the under-exploited enterprise segment.

Business users strive to become more productive in their daily work through the use of an efficient IT infrastructure. Many companies already use Virtual Private Network (VPN) technology today to securely access their Intranet remotely over the Internet (e.g. through PSTN dial up). A natural extension for these companies is to be able to access the same resources when on the move by using the data capabilities of mobile networks.

Most technical enablers are available today to enable mobile operators and other parties to fulfil these customer expectations and to implement mobile office offerings. On the one hand, GPRS networks and terminals are becoming widely available, allowing easier and more cost effective mobile data access. On the other hand, VPN technologies have matured and are used by many corporate users connecting to their Intranets via dial up. In short, operators have enough tools at their disposal to offer mobile intranet access to their customers.

This Northstream whitepaper briefly looks at the different technical options to implement mobile office solutions over GPRS and outlines the key elements operators should consider to satisfy corporate customers' needs.

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### About Northstream:

Northstream provides strategic technology and business advice to the global wireless industry. Northstream has assembled a multinational team with some of the world's best experts and analysts on wireless communication business and technology.

Northstream's list of clients include several of the world's leading operators and system suppliers, e.g. Vodafone, AT&T, NTT DoCoMo, Orange, Sonera, Telia, Mitsubishi, Ericsson, Nokia and Microsoft, as well as some of the leading investment banks and financial institutions. Northstream is established in Stockholm (Sweden), Sophia Antipolis (France), and Tokyo (Japan).

For more information please visit us at: [www.northstream.se](http://www.northstream.se)

***The need for mobile office services***

Increasing productivity is a permanent goal for companies around the world. In the 1980s and 1990s, great improvements in IT infrastructure helped companies to work more efficiently. For companies in which workers spend a lot of time out of the office, there is a considerable potential for further improvement in terms of efficiency.

Remote access to corporate office applications such as mail and calendar will improve productivity as well as convenience for business users. End-users do not have to spend much time outside the office to justify the value of access to such capabilities. Typical usage will most likely be frequent, short sessions, at times outside regular office hours. Most likely, this type of usage will be over phones or PDAs.

Companies in which workers spend a substantial amount of time outside the office will benefit from using remote access, with laptops or other devices, to corporate information, such as intranet and documents. Typical usage will be working sessions, related to travelling.

***Business customer's requirements***

For enterprise customers considering mobile office applications, an important aspect is to be able to reuse their existing IT infrastructure to support mobile access. However, additional mobile end user devices and/or software products in complement to existing IT infrastructure will have to be considered as a natural consequence of offering employees mobile access to corporate resources.

Another key consideration amongst all business customers is security. A survey of 500 small, medium and large corporations commissioned by Vodafone in July 2002 showed that, for 41% of businesses, security is the key concern when considering mobile office solutions. This anxiety regarding security is valid of course for customers new to VPN technologies but also for customers who already use VPN solutions over fixed lines but who fear additional threats inherent to mobile networks. Depending on to what corporate resources access is offered, different level of security requirement may apply.

Ease of use is also an important requirement. What users need to do when connecting to their Intranet over GPRS (or 3G) should not be more complex than when doing it over a fixed connection.

Finally, the overall pricing scheme for the service should be easy to understand for the companies. This is particularly true for the way the underlying GPRS bearer is priced.

### ***Options for offering mobile office services***

At a high level, technical options available to operators when implementing mobile office services can be classified into one of the following families:

- End-to-end VPN solutions;
- Network-based VPN solutions;
- Application-specific solutions.

#### ***End-to-end VPN solutions***

An end-to-end VPN solution is characterised by a secure connection between the end user device (e.g. laptop or PDA) and his corporate network. Several protocols can be used to implement this secure connection such as IPSEC (IP Security), L2F (Layer 2 Forwarding), PPTP (Point to Point Tunneling Protocol) and L2TP (Layer 2 Tunneling Protocol).

IPSEC-based solutions offer high quality security based on cryptography and are supported by a wide range of vendors (including Cisco, Axent, Check Point, and Nortel). However, one of their limitations is that they do not interwork easily with Network Address Translator (NAT)<sup>1</sup>, which has hindered their deployment by operators. Fortunately, these limitations are being addressed by standard bodies<sup>2</sup> and most vendors already offer pre-standard solutions<sup>3</sup>.

PPTP is supported by Microsoft and is bundled with every version of Windows: it is thus supported on laptops running Windows or on PDAs using Pocket PC.

For most corporations and IT managers this is the only acceptable solution for remote intranet access.

#### ***Network-based VPN solutions***

With this type of solutions, the end user trusts the GPRS network and the secure connection is only implemented between the operator GPRS network and the customer corporate network. This secure connection can be implemented in many different ways: leased line, layer 2 connection (e.g. Frame Relay or ATM Permanent Virtual Connection – PVC), IPSEC tunnel, or IP-VPN based on MPLS. In some cases, the operator offering the service may have to buy this VPN service from a fixed-line operator or an ISP.

#### ***Application-specific solutions***

These types of solutions cannot be considered as providing a true VPN functionality. They are characterised by the fact that they implement the security function at the transport or the application layer (using protocols such as SSL). This means that these solutions only apply to a specific application. A typical example is a secure mobile email solution (such as the one provided to users of BlackBerry devices). Other examples include WEB- or WAP- based applications: in such cases, the operator can still offer a range of services to the end users (e.g. email, access to corporate directories, access to diaries) although the secure interface is implemented through a single IP application (WEB or WAP).

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<sup>1</sup> NATs (Network Address Translators) are used by mobile network operators which allocate private IP addresses to their GPRS users

<sup>2</sup> IPSEC Working Group in the Internet Engineering Task Force (IETF)

<sup>3</sup> Based on UDP encapsulation of IPSEC packets; the disadvantage of pre-standard solutions is that they require the use of a VPN client and a VPN server (concentrator) from the same vendor

***Who can offer mobile office services?***

The type of technology used to implement a mobile office service has a direct impact on who can offer the service to business customers.

End-to-end VPN solutions are not dependent on any elements inside the mobile operator network and can hence be offered by any other players such as system integrators, ISPs and the VPN product vendors themselves. However mobile operators can differentiate themselves by, for instance, combining the VPN client with functionality specific to mobile networks, e.g. GPRS connectivity software or various messaging clients.

Network-based VPNs rely by definition on some network functionality. This network functionality can be provided by the mobile operator itself, by an ISP, or by a fixed telecommunication operator. In a sense, network-based solutions correspond to the traditional way operators sell services: the end user pays for some functionality provided by the network. Operators are thus in a good position to offer this type of solutions either through their own infrastructure, through the one of a company inside the same group or via a commercial agreement with a third party. As a connection to the GPRS network is needed to offer network-based VPN services to mobile users, nobody else can offer a similar service without an agreement with the mobile operator.

Application-specific solutions are, like end-to-end VPN solutions, independent of the network and can be offered by a whole range of players. These are thus also more difficult to control for operators than network-based solutions.

In short, the mobile office services market includes a range of players including mobile operators and, of course, all the companies providing remote access solutions over fixed dial-up access today. IT managers who want to enable remote access to their company corporate LAN over GPRS/3G will choose between the various entities selling such services. Likely criteria for making this choice will include price, level of security, integration with other services, ease of use, and support. In this complex market, mobile operators have the choice between a number of options. One possible strategy for mobile operators is to promote the use of mobile office services, even when they are provided by third-parties, as it generates data traffic on their networks. This may be done through partnership agreements with system integrators or ISPs. On the contrary, other operators will insist on offering mobile office services themselves trying to avoid being reduced to mere pipe providers.

***Mobile operator strategies for mobile office services***

Northstream believes that there is no unique solution applicable to all market cases. The choice of VPN technology depends on the specificity of the mobile operator as well as the requirements of targeted business segment. For example, an operator already offering a network-based VPN service, through for instance its ISP branch, may find natural to extend it by offering mobile access. In another scenario, if a company is only interested in one specific application such as email, then a "simpler" security solution specific to this application may be more appropriate, at least in the short-term.

However, despite this diversity both in terms of operators capabilities and in terms of customer requirements, Northstream believes that the strong security concern expressed by most business customers indicate that an end-to-end VPN solution based on IPSEC is in most cases the most suited solution. In addition to its strong security, an IPSEC-based solution carries the advantage of not requiring any dedicated connection to the mobile operator network (i.e. standard Internet connectivity is the only requirement). In addition, while companies often use network-based VPNs to interconnect their different offices, IPSEC-based solutions are the most common options for individuals remotely accessing their Intranet in particular through fixed dial-up connection. It is thus natural for customers to reuse these solutions in a very similar fashion over GPRS access.

Beyond the choice of technology, Northstream believes that operators should consider the following key elements when defining their strategies for mobile office services.

- It is essential that the operators' offers to businesses are clear and do not appear too fragmented.
- A mobile office offering can only be successful if the overall service package is attractive. Service simplicity, Pricing, Quality of Service and Roaming assurance are all key in this formula.
- Operators should have flexible offerings taking into account the different corporate segments. Some companies prefer to manage their VPN infrastructure themselves while others would leave it to the operators.
- The end user experience when accessing its company resources through GPRS should be as straightforward as possible. In particular, the initiation of the GPRS connection and the creation of the secure tunnel should not take more than 2-3 steps to be attractive (and thus used).

### **An example - Vodafone Mobile Office**

In November 2002, Vodafone launched "Vodafone Remote Access" and "Connected by Vodafone" as part of their "Mobile Office" program. "Vodafone Mobile Office" is Vodafone's new overall service proposition to business users and can be seen as a counterpart to the "Vodafone Live!" initiative with consumers.

"Vodafone Remote Access" is a remote access service offered by Vodafone in partnership with Cisco Systems. It relies on end-to-end IPSEC VPNs and comprises of four components:

- A VPN client: this is a piece of software which enables the IPSEC connection to be created;
- A GPRS datacard;
- A piece of software which enables easy connection to the GPRS network and which centralises all value-added functions through a Graphical User Interface (called "Dashboard" by Vodafone);
- A VPN concentrator and router.

Vodafone offers two options of the service depending on whether the customer wants to manage its VPN equipment or not.

"Connected by Vodafone" is a parallel initiative whereby Vodafone has signed global agreements with major computer equipment manufacturers including Dell, Fujitsu-Siemens, Hewlett Packard, IBM, Psion Teklogix and Toshiba. One of the presumed goals of Vodafone is to "control" the customer experience when they use laptops or PDAs to connect to their office environment through, e.g. "Vodafone Remote Access". This approach is similar to the one taken with handsets in the "Vodafone Live!" offering to consumers.

Northstream believes that initiatives such as "Vodafone Mobile Office" are steps in the right direction as they would shake up the mobile data market and send clear and strong marketing messages to business users across several European countries and start the 'ball rolling'.

### **Conclusions**

Initiatives like this "Mobile Office Program" by Vodafone will push competitors to launch similar offers and corresponding marketing campaigns across Europe in 2003. Given the relatively poor uptake of wireless data services in the corporate segment, such launches would come very timely especially in the mature European markets. It is essential that operators boost data usage and proactively convince business customers that productivity can be greatly improved with the office IT environment accessible through mobile access. A key 'convincing factor' is to deliver attractive service offerings rather than market various technologies.

It is Northstream's opinion that the necessary tools to offer different flavours of mobile office services are available to operators, and thus the means to adapt offerings to the specific needs of the different business segments. One key aspect for mobile operators (or their partners) is to be able to match the know-how and capabilities of the sales and support offered by their competitors. It is essential that mobile operators gear up their delivery channels for this type of services, including the very important customer interface towards IT managers of the targeted companies.

All in all, as "traditional" customer segments reach saturation in many markets, it is key that operators move further and proactively into the relatively underserved business segment to exploit all of its potential. With a good understanding of mobile office type of services, from both the technology and the business point of view an operator would be well positioned to face competition from traditional VPN players and capture vital market segments for further growth and profitability. Northstream are working with mobile office aspects with various players in the industry, on both the operator and supplier side, and can contribute with valuable know-how and experiences in this rather complex field.

#### **Contact:**

Northstream has studied all aspects of **mobile office services**. Please contact us if you would like to find out more about this or about our company and the services we provide.

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