

Liberating the mobile internet!

*Presentation at EUC
October 21st, 2004*

Mobile Internet

- ♦ **Promised for years**
- ♦ **Now targeting non-technical consumers**
- ♦ **Handset features increasing rapidly**
- ♦ **Strong end user interest**
- ♦ **Still very low usage !!!**

Why ?

- ◆ **Technical barriers**

- ★ Terminal service configuration data not in control of operator !

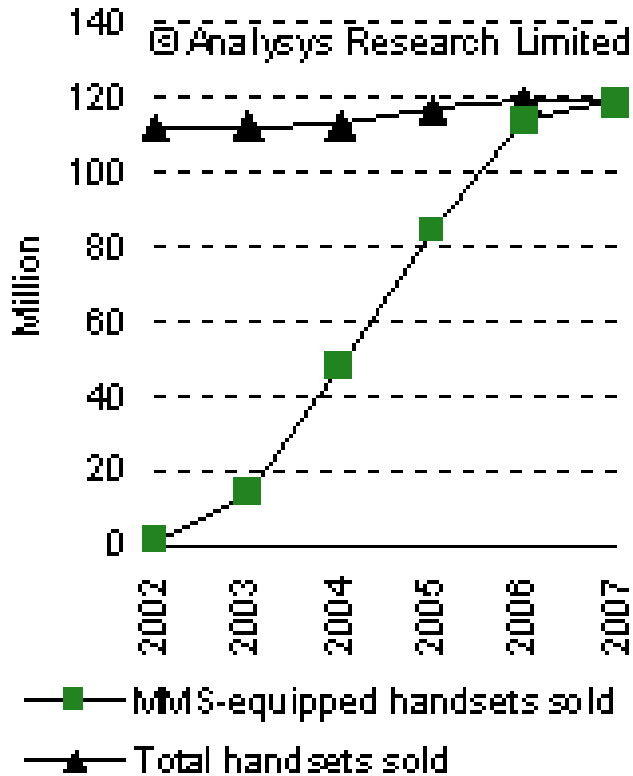
- ★ May require subscriber to request provisioning of services not being understood

Research on user behaviour shows:

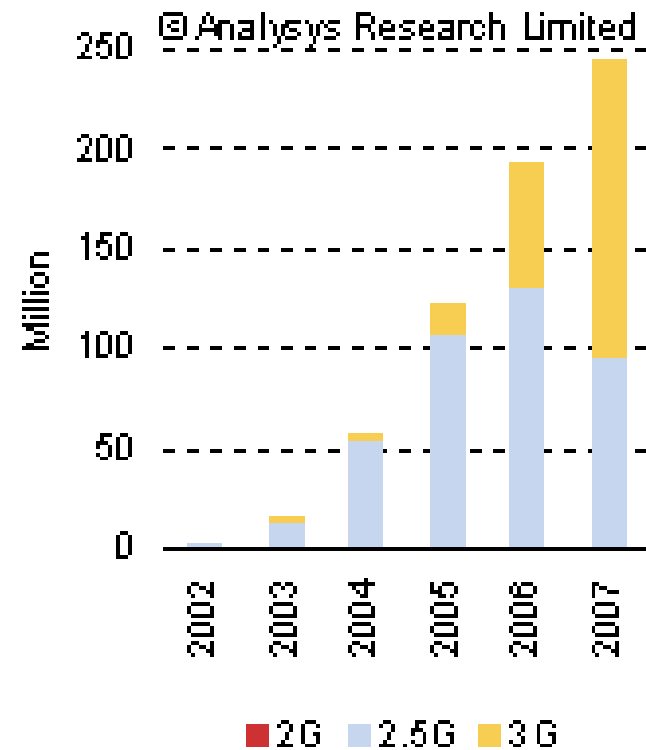
- ❖ **Typically, when a user has failed (twice) to manually configure their mobile device, he or she gives up and never tries again!**
- ❖ **Demand for data services is instant. If they cannot have the service now, they will not try again later!**
- ❖ **The user expects network configurations to be solved from their mobile device!**

Source: Northstream

MMS forecast for Western Europe



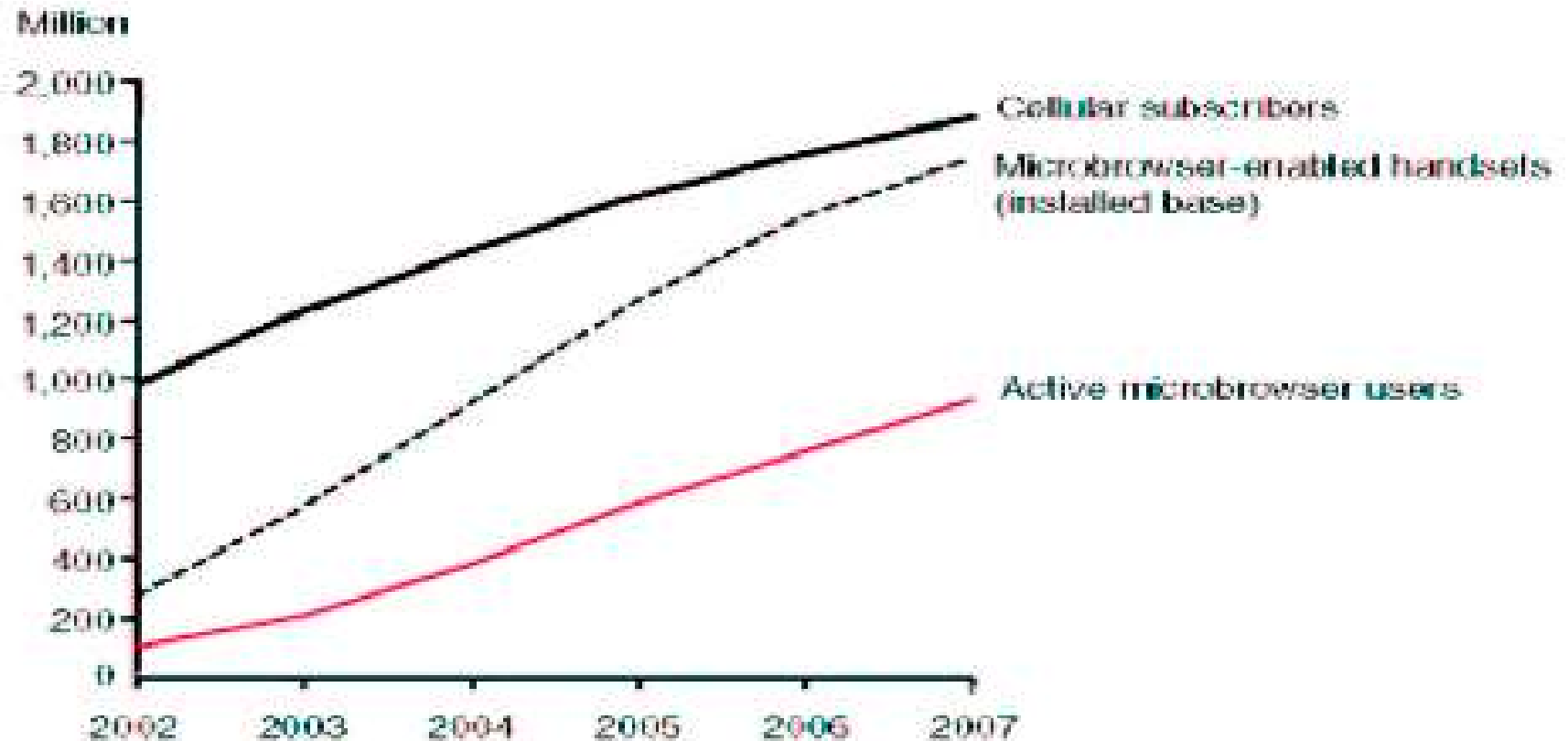
Yearly sales of MMS phones.



Total no. of MMS phones.

Source: Analysis Research Ltd

Gap of un-configured devices



Solution: Synapse DMC !

- ◆ **Patented solution featuring:**
 - ★ Automatic service provisioning
 - ★ Automatic Over-The-Air configuration
 - ★ Enhanced customer care interface
 - ★ Business Intelligence
- ◆ **To deliver:**
 - ★ Increased traffic
 - ★ End user satisfaction
 - ★ Reduced operational costs for customer care

Automatic process includes:

Detection

Automatic detection of new subscriber/terminal combinations.

Provisioning

Automatic provisioning of subscribers in MMS-C and other nodes.

Configuration

Automatic configuration of network access settings for all capable phones.

Customer Care

Real-time provisioning and Device db queries via web GUI.

Device Detection

- ♦ **Detect new combinations of subscriber devices**
- ♦ **Identify device capabilities**
- ♦ **Device database with**
 - * > 6000 device models
 - * > 1300 MMS capable device models
- ♦ **Device alias management**

Automatic detection options

- ❖ **Vendor independent monitoring of network traffic**
 - ❖ Intelligent monitoring probes (A & D interfaces)
- ❖ **Concentrated methods**
 - ❖ Monitoring of extended MSC – EIR (F interface)
 - ❖ Integrated extended EIR (active)
- ❖ **Vendor specific MSC/HLR triggers (when available)**
 - ❖ Ericsson
 - ❖ Nokia
- ❖ **Via CDR file processing**

Provisioning framework

- ❖ **Via Customer Administration System (CAS) interface**
- ❖ **Provision subscriber GPRS in HLR**
- ❖ **Provision subscriber in MMS-C**

Supported OTA protocols

- ❖ **Ericsson/Nokia OTA settings**
- ❖ **OMA – Client Provisioning Spec.**
- ❖ **WAP Client Provisioning 1.0**
- ❖ **OpenWave Primary Provisioning**
- ❖ **OMA DM (SyncML DM) in roadmap**
- ❖ **Virtually all OTA and GPRS capable phones are supported!**
- ❖ **1300+ MMS capable phones are currently supported**

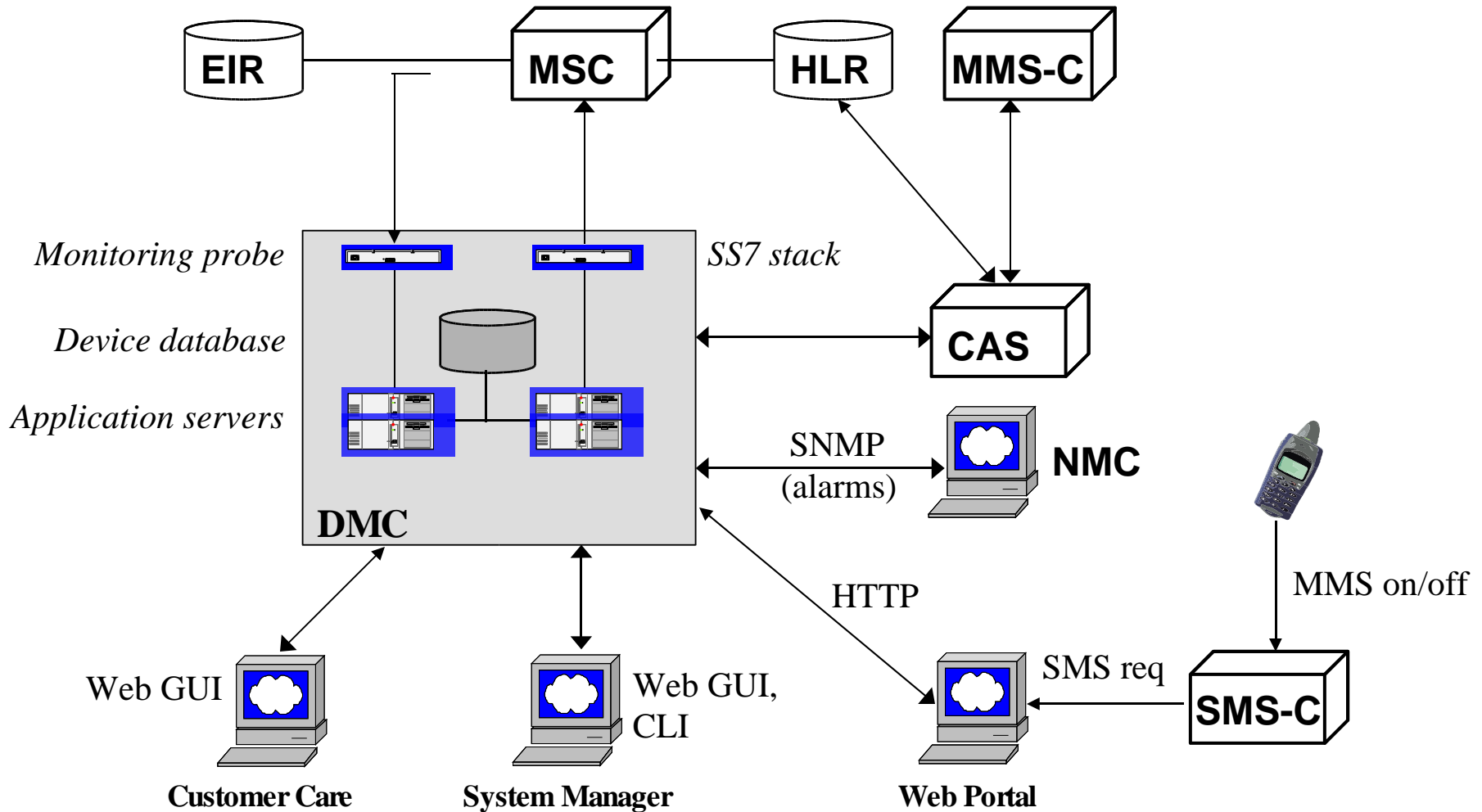


Automatic MMS provisioning example:

- ❖ **Detect MMS capable terminal devices**
- ❖ **Check HLR subscriber status (Operator barring and MSISDN, GPRS status)**
- ❖ **Check for pre-paid subscribers**
- ❖ **Check MMS user status**
- ❖ **Provision subscriber in MMS-C and HLR**
- ❖ **Send out notification (if requested)**
- ❖ **Send out device settings**
- ❖ **Send out Welcome MMS message**

System overview – CYTA project

MAP_CHECK_IMEI_WITH_IMSI



DMC 2.0 installation example

- ❖ **Firewall**
- ❖ **Ethernet switch**
- ❖ **SS7 stack**
- ❖ **Corelatus GTH probe**
- ❖ **2 x Sun Fire V240**



System environment

- ◆ **OTP R9C-0 design base**
- ◆ **Unimind cluster**
- ◆ **Solaris 8 (and Linux)**
- ◆ **TietoEnator Portable SS7**
- ◆ **Synapse 3GPP/GSM MAP**
- ◆ **Rapid Installer**

MAP

- ♦ **Full support for MAP v1 – v8**
- ♦ **Automatic stub generation**
- ♦ **Source in CVS is ETSI .pdf files**

Event Queues

- ◆ **Multiple producer/consumer queues**
- ◆ **Backed by persistent storage**
- ◆ **Transaction protected**
- ◆ **Used for all IPC**

BETS

- ♦ **Berkeley DB Erlang Term Store**
- ♦ **Mnesia binding**
 - * > 20.000.000 records per table
 - * ~ 10.000 random lookups/sec
 - * ~ 1500 inserts/sec
 - * Approximate lookup support

Subscriber database

- ◆ **Record update time stamps**
- ◆ **Local content tables**
- ◆ **Explicit synchronization**

WebGUI

- ♦ **Yaws**
- ♦ **Form management library**
- ♦ **Dynamic .gif**
- ♦ **Dynamic CSS**
- ♦ **Dynamic JS**
- ♦ **Yaws embedded applications**

Rapid installer

- ♦ **Bootable Solaris CD**
- ♦ **Preconfigured stage dumps**
- ♦ **Installs a system in < 20 minutes from power on**

System characteristics

- ◆ **Cluster service fail-over time ~1 sec**
- ◆ **Support up to 20.000.000 subs on entry level config**
- ◆ **~450 end-to-end TPS on entry level config (requirement 150)**

System metrics

- ◆ **180k lines of Erlang code**
- ◆ **22k lines of C code (linked in drivers)**

Does the system deliver ?

♦ **Real life example:**

- * 1200% increase in MMS handset sales over 9 months
- * 84% of new MMS terminals become active users
- * Only 12% of MMS subscribers call customer care
- * Non-OTA terminals loose market share

Thank You for Your attention!

See you at ErLounge tonight !