

MExE

Mobile Execution Environment

...making the multimedia internet mobile...

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## MExE timetable

**2G and 3G Services**

**MExE overview**

**MExE functionality**

**MExE domains and security**

**MExE Release 4 issues**

**MExE Release 5**

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- **MExE (Release 98)**
    - **WAP and PersonalJava classmarks**
    - **approved 2Q99**
  - **MExE (Release 99)**
    - **SIM security enhancements**
    - **Quality of Service management**
    - **approved 4Q99**
  - **MExE (Release 4)**
    - **Java CLDC/MIDP classmark**
    - **other updates/additions**
    - **approved 4Q00**

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- **Service creation before Release 99**
    - Supplementary services
    - limited, expensive to develop, difficult to deploy, limited use
    - isolated from 3<sup>rd</sup> party services developers, no internet
    - offered operators same bland services and no differentiation
  - **Service creation since Release 99**
    - services as a general principle not standardised
    - instead toolkits standardised, and services created using the toolkits
    - Seamless internet and intranet access
    - compatibility with internet multimedia communications

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- **mobile phones fully internet integrated**
  - **new operator/3<sup>rd</sup> party IP multimedia services**
  - **new personalised IP multimedia services rapidly developed to differentiate operators, reduce “churn”**
  - **generally no services standardised, but enabled using 3GPP services toolkits (MExE, OSA, CAMEL, (U)SAT) and IP/IT toolkits**
  - **consistent “look’n’feel” of services within the VHE**

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- **standardised execution environments in mobile phone**

- WAP 
- PersonalJava
- CLDC/MIDP Java



- **applicable to 3G, non-3G, cordless and fixed environments**

- **IT/IP multimedia services on mobile phones/servers**

- write once, execute on many mobile phones

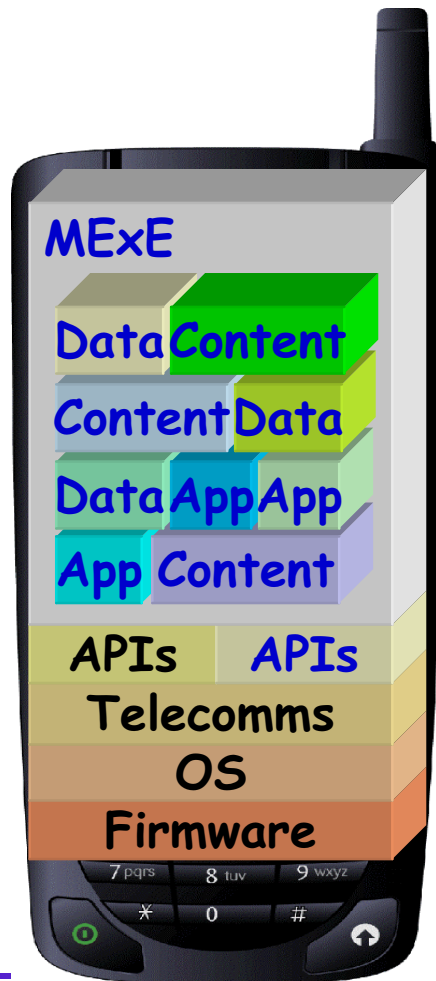
- **transfer of multimedia services**

- up/downloading, network/3rd party, MExE-to-MExE services

- **standardised negotiation of capabilities with servers**



## The MExE framework sits in mobile phone architecture...



- ◀ HTTP/WSP (with capability exchange)
- ◀ MExE executables, data and content
- ◀ MExE framework (MExE classmark 1, 2, 3)
- ◀ APIs: manufacturer, MExE classmark
- ◀ GMS/UMTS software
- ◀ Mobile phone OS
- ◀ Manufacturer's firmware
- ◀ Manufacturer's mobile phone unit

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- **standardised set of MExE classmarks**
    - WAP, WAP/PersonalJava, CLDC/MIDP
  - **multimedia services supported by all devices of a given classmark (CM)**
    - CM1 devices support CM1 applications, CM2 devices support CM2 applications, CM3 devices support CM3 applications
  - **wide variety of multimedia services**
    - with no standardised 3G services, MExE enables operator/3<sup>rd</sup> party multimedia service delivery to users
  - **sophisticated user interface**
    - advanced services presentation
    - Graphical User Interface (GUI)

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- **customisation and personalisation**
    - services “look and feel” (user interface and services personalisation)
    - services communication with network/non-network nodes
    - operator branding and differentiation
    - enables the Virtual Home Environment
  - **user services management**
    - services download
    - services/data management
    - determine active services

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- **re-use of existing technologies**
    - software industry expertise, development tools
    - WAP, Internet and Intranet
    - existing APIs, (i.e. WAP, PersonalJava, Java MIDP/CLDC...)
  - **capability negotiation**
    - allows servers and MExE mobiles to determine the most suitable content format for the device (e.g. depending on screen size, memory, colour capabilities etc.)

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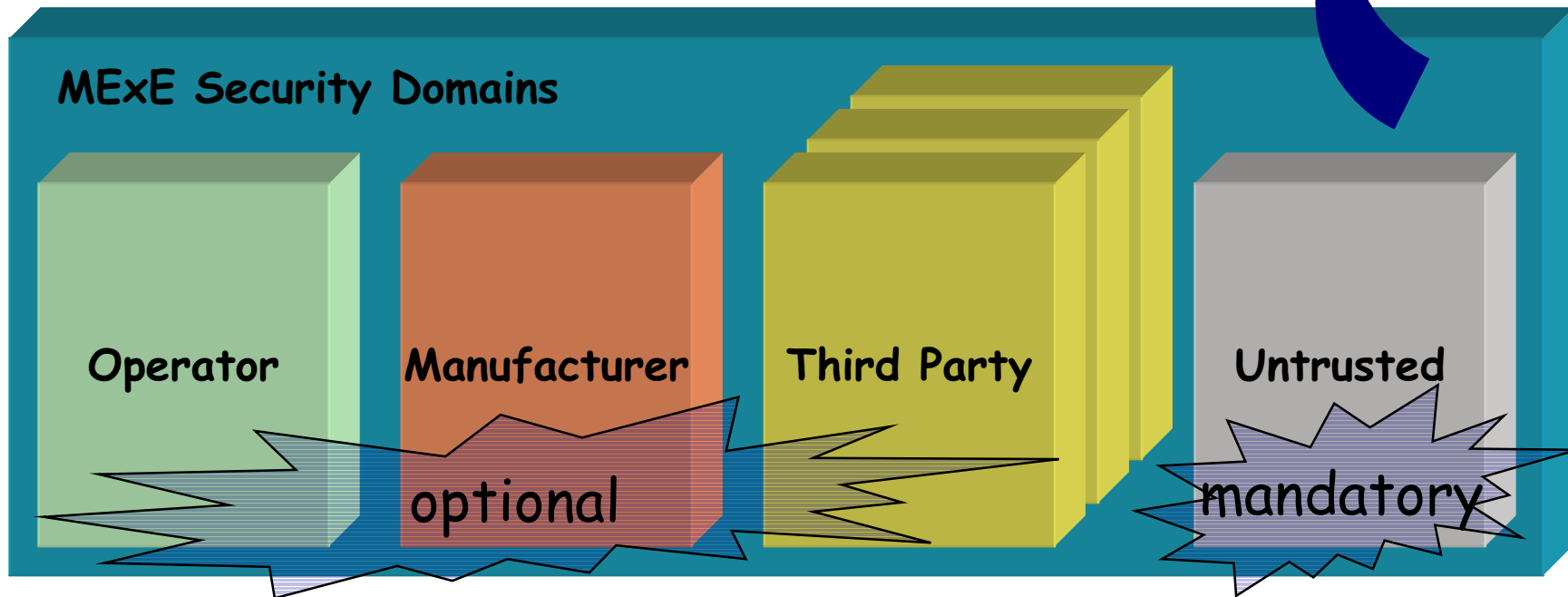
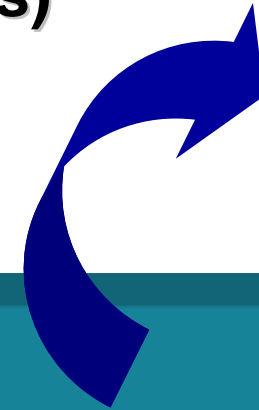
**MExE Release 4 issues**

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# MExE Security Domains

MExE

- **secure environment for multimedia services**
- **3 optional security domains (PKI certificates)**
- **multiple Third Party domains permitted**
- **1 “untrusted” area**



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- **only operator PKI authenticated multimedia services permitted**
  - **operators provide existing services and new multimedia services**
    - **branded services**
    - **franchised services**
    - **customer support**
    - **service personalisation**
  - **defined set of mandatory security restrictions on downloaded applications**



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- **only manufacturer's PKI authenticated multimedia services permitted**
  - **permits mobile phone upgrades**
    - **“provisioned applications” upgrade**
  - **user interface upgrades**
  - **software updates**
  - **manufacturer's multimedia services**
  - **defined set of mandatory security restrictions on downloaded applications**

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- **“Administrator” determines whether Third Party domain is controlled by the operator or user**
    - **Operator controlled: operator decides which (if any) PKI authenticated third party services**
    - **User controlled: user decides which PKI authenticated third party services**
  - **defined set of mandatory security restrictions on downloaded applications**

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- **user in control of the untrusted area**
  - **user downloads any multimedia service as desired**
  - **downloaded multimedia services have limited permissions (only with explicit user authorisation)**
    - **call origination**
    - **screen access**
    - **sending DTMF**
    - **add phonebook entry**
  - **defined set of mandatory security restrictions on downloaded applications**

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- **explicitly defining the certificate verification process**
    - need to clearly identify the process
    - need to define demotion of signed content to Untrusted Area
      - only in specifically defined cases
      - demoted content restricted to same basic functionality as untrusted applications
  - **pre-launch verification of executables**
    - applications require to be verified before being launched
    - clarify rules on operator applications

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- **administrator designation process**
    - tidying up terminology
  - **handling of operator applications on (U)SIM activity**
    - operator executables currently have special handling
    - should operator executables be permitted to execute even if the (U)SIM is not available?
    - should operator executables also require pre-launch verification?
  - **(U)SIM terminology**
    - Replace terminology of “(U)SIM removal/insertion” with “accessing valid (U)SIM application”

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# R5 Enhancements and Improvements WID

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- **General enhancements and improvements**
  - **Investigate/identify VHE User Profile support**
  - **Investigate/identify USAT/OSA/CAMEL interaction**
  - **Investigate/identify new CLI classmark**
  - **Investigate/identify terminal management support**
  - **Investigate/identify AT commands support**
  - **Investigate/identify Push services support**
  - **Investigate/identify service provisioning support**



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- **Conduct a threat analysis of MExE to review the security features for effectiveness in countering those threats.**
    - **Perform a security analysis for the different releases of MExE and the associated classmarks**
    - **Identify issues in terms of security concepts and mechanisms for MExE**
    - **Identify potential threats, weaknesses and security shortfalls**
    - **Create policy as countermeasures for identifiable weaknesses**
    - **To map policies to the requirements within the specification**
  - **The output TR will be used as a basis to potentially agree CRs to S1's 22.057, T2's 23.057, and S3's 21.133 and 23.102.**