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Marco Island, FL, USA, 5 - 7 June, 2002

Tdoc TP-020106

3GPP TSG-T2 #17
Vancouver, BC, Canada
13 -17 May 2002

T2-020575

Work Item Description

Title   Binary code execution feasibility study

Evolving from the established MExE Release 1998, Release 1999, Release 4 and Release 5 specifications, the MExE Release 6 work extends and develops the UE-based support of the client/server model for the flexible support of 3G services (e.g. multimedia services).

1   3GPP Work Area

	Radio Access
	Core Network
X	Services
X	Terminals

2   Linked work items

MExE Security

3   Justification

MExE is based on the concept of identifying external standards suitable for supporting services from an UE, and bringing them into the 3GPP scope by direct reference. In particular MExE enables the access to content and services from operators, manufacturers and third party servers, and from the Internet.

For Release 6 T2 will investigate the adoption of execution environments, based on binary native code as new classmarks. This enables developers to create a new generation of wireless applications taking direct advantage of the possibility to address the core functionality of the chipsets, giving the application writer the benefit of greater speed, smaller memory requirements, etc.

Recently, two candidate MExE classmarks, the Wireless Gaming Engine (WGE) and the Binary Runtime Environment for Wireless (BREW), have been proposed. In both WGE and BREW, applications written in C/C++ are compiled into binary code that executes natively on the device processor. This is in contrast to the current Java and ECMA CLI MExE classmarks, in which applications execute under the control of software-based, managed-code execution environments (Java virtual machines and the .NET Runtime Execution Engine, respectively).

Managed-code runtimes offer a number of benefits, including application portability across different hardware platforms and run-time security checks to guard against malicious or faulty applications. However, the memory requirements of managed-code runtimes are greater than those of binary execution environments, and managed-code execution speed is slower. Support for native-code applications in MExE will complement the existing MExE classmarks in a number of ways:

- Playing games is one of the more popular leisure-time activities. The investigation of executing binary code can be used to determine feasibility of bringing even more powerful and graphically challenging games/entertainment to the MExE devices and under full control by the MExE security framework.
- Classmarks that support C/C++ will allow developers for this popular language family to write applications for MExE devices.
- Easy porting of existing application content from other C/C++ platforms, which gives access to a large already existing portfolio of applications.

- The very small memory footprints of binary execution environments will allow MExE executables to run on low-end devices with limited memory.
- Putting native execution speed at the disposal of developers will result in the availability of a wider range of compelling resource-intensive applications.

4   Objective

The work covered by this WID will include:

- Investigate and identify the security and portability ramifications of executing native applications on MExE devices.
- Investigate and identify techniques for ensuring secure execution of native code in the MExE framework (certification testing of applications, developer authentication, hardware support such as Memory Management Units (MMUs), etc.).
- Investigate combined native and managed execution environments, with untrusted applications executing only in the managed environment.

Result of these analyses will be a feasibility study.

5   Service Aspects

MExE supports services via applications on the UE, possibly interacting with applications on remote servers.

6   MMI-Aspects

MExE supports MMI enhancements via applications and browsers in line with the principles of VHE.

7   Charging Aspects

MExE enables MExE executables to potentially support charging for services. T2 will liase with TSG-SA5 for charging-related issues.

8   Security Aspects

T2 will liase with TSG-SA3 to ensure support for any security-related changes and improvements that may be identified.

9   Impacts

Affects:	USIM	ME	AN	CN	Others
Yes		X			
No			X		
Don't know	X			X	

10   Expected Output and Time scale (to be updated at each plenary)

New specifications						
Spec No.	Title	Prime rsp. WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#	Comments
TR	TR	T2		TSG-T#16	TSG-T#17	Feasibility Study
Affected existing specifications						
Spec No.	CR	Subject		Approved at plenary#		Comments

11   Work item rapporteur

Mark Staskauskas (Qualcomm)

12   Work item leadership

TSG-T2

13   Supporting Companies

BT, Hewlett-Packard, Media Farm, Qualcomm, TTPCom,

14   Classification of the WI (if known)

	Feature (go to 14a)
X	Building Block (go to 14b)
	Work Task (go to 14c)