

SAMPLE MULTOS & APPLICATION DEVELOPMENT TRAINING MODULES

Module:	1	Audience:	General
Title:	Introduction	Technical Level:	Low
Owner:		Duration:	15 mins
<p>Summary:</p> <p>Introduces the training programme, sets the agenda for the course and invites participants to introduce themselves and their expectations and objectives in attending.</p> <p>Topics include:</p> <ul style="list-style-type: none"> • Introduction to Multos International • Participant introduction • Participant Expectations • Agenda for the training programme • Admin and housekeeping 			

Module:	2	Audience:	General
Title:	What is MULTOS?	Technical Level:	Low
Owner:		Duration:	45 mins
<p>Summary:</p> <p>Introduces the MULTOS technology from the perspective of the device architecture, the capability and issuer-centric features of the scheme. Explains the nature of MULTOS, touches on the security requirements which steered the design; the card life cycle from semiconductor manufacture to deployment; provides a comparison from smartcard processor to desktop processor.</p> <p>Topics include:</p> <ul style="list-style-type: none"> • Device architecture • Industry controlled standard • Card life cycle overview • Issuer-centric business model • Security drivers • Trust model • Development evaluation • Platform/environment comparison • Multiple and dynamic applications 			

Module:	3	Audience:	General
Title:	MULTOS Players	Technical Level:	Low
Owner:		Duration:	30 mins
Summary:			
<p>Identifies the entities involved and explains their roles in the MULTOS scheme. Provides a roadmap to vendors, developers and key management authorities.</p> <p>Topics include:</p> <ul style="list-style-type: none"> • Multi-Application smartcard environment and components • The MULTOS players • MAOSCO's role and its relation to MCI and MXI • The Role of the Key Management Authority (KMA) • The MULTOS Issuance Partner programme 			
Module:	4	Audience:	General
Title:	MULTOS Card Life Cycle	Technical Level:	Low
Owner:		Duration:	30 mins
Summary:			
<p>Brief overview on the stages and artefacts required during the life-cycle of a MULTOS device. Identifies and explains the purpose and behaviour of each stage. Introduces the audience to the files and key material required for each stage, and can also address the differences between MULTOS and MULTOS step/one products if required.</p> <p>Topics include:</p> <ul style="list-style-type: none"> • Chip manufacture • Card enablement • Physical personalisation • Application load • Customisation/personalisation • Application usage • Application delete • Card expiry 			

Module:	5	Audience:	Developers
Title:	Interface Device to MULTOS Card Communications	Technical Level:	Medium
Owner:		Duration:	45 mins
Summary:			
<p>Introduction to card-IFD (interface device) communications. A description of the basic mechanisms and protocols used for communication between a card and a card reader (or interface device).</p> <p>Topics include:</p> <ul style="list-style-type: none"> • Answer to Reset (ATR) including dual ATRs and interface and historical bytes • ISO and MULTOS file structures • Typical communication session between card and IFD including command cases • Introduction to T=0 and T=1 protocols 			

Module:	6	Audience:	Developers
Title:	MULTOS Application Abstract Machine and MEL	Technical Level:	Medium
Owner:		Duration:	45 mins
Summary:			
<p>The MULTOS virtual machine or Application Abstract Machine (AAM) provides a rich set of APIs for use by application developers. The MULTOS Executable Language (MEL) supports the development of compact code for the smartcard environment.</p> <p>Topics include:</p> <ul style="list-style-type: none"> • MULTOS design principles and architecture • The MULTOS Application Abstract Machine • The MULTOS run-time environment • The MEL instruction set • MEL Primitives & Primitive types • MEL Codelets • Delegation 			

Module:	7	Audience:	Developers
Title:	MULTOS Enablement	Technical Level:	Medium
Owner:		Duration:	45 mins
Summary:			
<p>A card enablement process is required for each MULTOS card in the MULTOS scheme. It releases the card from the safety transport mechanism and binds the card to the card issuer.</p> <p>Topics include:</p> <ul style="list-style-type: none"> • Enablement stages • The purpose of enablement • Enablement chart • MULTOS KMA Interface file formats for enablement • Enablement process • Enablement related APDU commands • MAOSCO application loader and its use • Product IDs • Control data date • Step/one Enablement 			

Module:	8 (a)	Audience:	General
Title:	MULTOS Application Loading and Deleting: Overview	Technical Level:	Medium
Owner:		Duration:	45 mins
Summary:			
<p>Introduces the MULTOS framework for loading and deleting applications on a MULTOS card. Describes the parties involved, and introduces the on-card and off-card procedures.</p> <p>Topics include:</p> <ul style="list-style-type: none"> • Players (Application Issuers, Providers, Developers, etc). • Types of applications (unprotected, protected, confidential) • Applications, open, load, delete, IFD commands and processes • Step/one application loading 			

Module:	8 (b)	Audience:	Technical
Title:	MULTOS Application Loading and Deleting details	Technical Level:	Medium
Owner:		Duration:	40 mins
Summary:			
<p>A how-to description of the procedure for loading/deleting application on a MULTOS card. Starts with making requests and receiving certificates from MAOSCO using MSPI, and describes MULTOS IFD</p> <p>Topics include:</p> <ul style="list-style-type: none"> • Details on MSPI requests and responses • Details on open/load/delete commands and MULTOS processes • Discussion of keys involved and purpose • Supporting MAOSCO documentation 			

Module:	9	Audience:	Technical
Title:	MULTOS Codelets	Technical Level:	Medium
Owner:		Duration:	40 mins
Summary:			
<p>Introduction to creating a variant of MULTOS applications that may be integrated into a ROM mask – called codelets. Discussion of the various steps required and process for generating a codelet for MULTOS.</p> <p>Topics include:</p> <ul style="list-style-type: none"> • Codelets & Codelet terminology • Codelet properties • Protection mechanisms • Codelet development • Codelet primitives • Support from Multos International 			

Module:	10	Audience:	Technical
Title:	MULTOS Application Development & Development Tools	Technical Level:	High
Owner:		Duration:	40 mins
Summary:			
<p>Introduction to creating a variant of MULTOS applications that may be integrated into a ROM mask – called codelets. Discussion of the various steps required and process for generating a codelet for MULTOS.</p> <p>Topics include:</p> <ul style="list-style-type: none"> • Codelets & Codelet terminology • Codelet properties • Protection mechanisms • Codelet development • Codelet primitives • Support from Multos International 			

Module: 11	Audience: Developers
Title: MULTOS Sample Application Development: PC Demonstration	Technical Level: High
Owner:	Duration: Half day
<p>Summary:</p> <p>Developer-level training designed to allow developers to walk through the development of a sample MULTOS application. Includes utilising the MULTOS tools to develop/modify and debug a sample application.</p> <p>Assumes programming knowledge and the more technical aspects of the MULTOS training presentations. <i>Uses SmartDeck to modify a sample application and debug it.</i></p>	

SAMPLE - Not For Distribution