# A Decentralized Model for Information Flow Control Andrew C. Myers and Barbara Liskov, 1997

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#### Introduction

What it is not What it is

DLM Basics

Terminolog

Labels

Operation

#### Example

Code Example

#### Advanced

Future Works

The result of this paper is a model for controlling information flow: Decentralized Label Model (DLM).



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Introduction What it is not

What it is How it differ

How it differs

DLM Basics

Terminology

Example

Advanced

Conclusion

It is not:



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#### Introduction What it is not

What it is How it differs

DLM Basics Terminology

Concretion

Example

Code Examp

Advanced

Future Works

### It is not:

► Access Control (inter-application communication)



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#### Introduction What it is not

What it is How it differs

DLM Basics

Terminolo

Operatio

Example

Advanced

### It is not:

- Access Control (inter-application communication)
- ► Authentication, Authorization, Confidentiality, etc.



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#### Introduction What it is not

What it is

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Terminale

Labels

Operatio

Example

#### Code Exan

Advanced

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Future Works

### It is not:

- ► Access Control (inter-application communication)
- ► Authentication, Authorization, Confidentiality, etc.

This means that DLM will not ensure:



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#### Introduction What it is not

What it is

How it diffe

#### DLM Bas

Labels

Operatio

#### Example

Code Examp

#### Advanced

Conclusion Future Works

#### It is not:

- ► Access Control (inter-application communication)
- ► Authentication, Authorization, Confidentiality, etc.

This means that DLM will not ensure:

secure communication between applications



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Introduction What it is not

How it differ

DLM Basic

Labels

Operatio

Example

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Advanced

Eutura Works

### It is not:

- ► Access Control (inter-application communication)
- ► Authentication, Authorization, Confidentiality, etc.

This means that DLM will not ensure:

- secure communication between applications
- ▶ limited access to data once released



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Introductio

What it is no

What it is

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JLIVI Basio

Terminolog

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Example

Advanced

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Introductio

What it is

How it diffe

DLM Basics

Terminology

Labels

Operation

Example

Advanced

Conclusion

### It is:

► Information Flow Control



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What it is

**DLM Basics** 

Advanced

### It is:

- Information Flow Control
  - Decentralized



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#### Introductio

What it is no

What it is How it diffe

DLM Basics

#### Torminology

Labels

Operation

#### Lxample

Code Exampl

Advanced

Euturo Works

### lt is:

- ► Information Flow Control
- Decentralized

This means that DLM will help ensuring:



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#### Introductio

What it is no

What it is

How it diffe

### **DLM Basics**

Terminolog

Labels

Operation

#### Example

Code Exampl

Advanced

Eutura Works

### 3 It is:

- ► Information Flow Control
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This means that DLM will help ensuring:

not releasing sensitive data



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Introductio

What it is no

What it is

How it diffe

DLM Basi

Terminolog

Labels

Operation

Carla Francis

Code Examp

Advanced

Conclusion

### It is:

- ► Information Flow Control
- Decentralized

This means that DLM will help ensuring:

- not releasing sensitive data
- not implicitly releasing sensitive data



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Introduction

What it is n

What it is

How it diffe

DLM Basic

Terminolog

Labels

Operation

Example

Code Examp

Advanced

Conclusion

### lt is:

- ► Information Flow Control
- Decentralized

This means that DLM will help ensuring:

- not releasing sensitive data
- ▶ not implicitly releasing sensitive data
- ► not giving away hints of inner workings



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How it differs

**DLM Basics** 

Advanced

DLM differs from previous solutions as it is:



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How it differs **DLM Basics** 

Advanced

DLM differs from previous solutions as it is:

decentralized



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How it differs **DLM Basics** 

Advanced

DLM differs from previous solutions as it is:

- decentralized
- less restrictive of allowed computations



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How it differs

Advanced

DLM differs from previous solutions as it is:

- decentralized
- less restrictive of allowed computations
- not completely disallowing inter-application communication



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Introduction What it is not

How it differ

#### DLM Basics

Terminology Labels

Example

#### Code Example

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### Advanced

Future Works



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What it is no

What it is How it differ

DLM Basics

Terminology

Operation

Example
Code Example

Advanced

Future Works

Principals represent users and other authoritative entities.



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What it is no What it is

DLM Basics

Terminology Labels

Operation

Example Code Examp

Advanced

Future Works

Principals represent users and other authoritative entities. Values are entities computations can manipulate.



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Introductio
What it is no

What it is How it differ

DLM Basics

Terminology

Congration

Example

Example Code Exampl

Advanced

Future Works

Principals represent users and other authoritative entities.

Values are entities computations can manipulate.

Slots are value-holders (e.g. variables, objects, and other storage locations).



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Introduction
What it is not
What it is

DLM Basics Terminology

Labels

Example

Code Exampl

Advanced

Future Works

Principals represent users and other authoritative entities.

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Slots are value-holders (e.g. variables, objects, and other storage locations).

Input channels are read-only sources that allow information to enter the system.



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Introductio What it is no What it is

How it differs

Terminology Labels

Example

Code Example

Advanced

Conclusion Future Works Principals represent users and other authoritative entities.

Values are entities computations can manipulate.

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Input channels are read-only sources that allow information to enter the system.

Output channels are information sinks that transmit information outside the system.



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Introductio
What it is no
What it is

How it differs

Terminology Labels

Labels Operation

Example Code Example

Advanced

Conclusion

Future Works

Principals represent users and other authoritative entities.

Values are entities computations can manipulate.

Slots are value-holders (e.g. variables, objects, and other storage locations).

Input channels are read-only sources that allow information to enter the system.

Output channels are information sinks that transmit information outside the system.

Labels are attached to values, slots or channels (more to follow).

13



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Introduction What it is not

How it differ

DLM Basic

Terminolog

Labels

Example

Advanced

Conclusion



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Introduction What it is not

Write it differ

DLM Basic

Terminolog

Operations

Example Code Example

Advanced

Conclusion

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13



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### Introduction

What it is not

How it differ

#### DI M Pagia

Terminolog

Labels

#### Operation

### Example

Code Example

Advanced

Euturo Works

Department of Computer Science Aalborg University Denmark

13



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Introduction

How it differs

DI M Bacio

Terminolog

1 -1-1-

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Example

Code Example

10

13

Advanced

Conclusion

Future Works



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### Introduction

What it is no

How it differ

#### DLM Basic

Labels

Operation

### Example

Code Example

### Advanced

13



### Conclusion

#### Decentralized Label Model

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### Introduction

What it is

How it differ

#### DLM Basic

Terminolo

Caratia

#### Example

Code Evample

Advanced

### Conclusion

Euturo Worke

12

13



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Introduction
What it is no

How it differ

#### DI M Ponio

Terminolo

Labelo

#### Example

Code Evamr

### Advanced

Conclusion Future Works

(13

## Questions?

