

(CIM)

Analysis of Common Information Model(CIM) for the System Management

(Y.H. Kim)
(J.Y. Kim)
(H.N. Cho)
(C.W. Ahn)
(S.I. Jung)



Force)

가

, DMTF(Distributed Management Task
CIM(Common Information Model)

I.

가

IT

가

IT

[1].

II.

가

SNMP(Simple Net -

work Management Protocol) MIB(Ma- ructure of Management Information)
 nagement Information Base), MIB [2].
 DMI(Desktop Management Inter-
 face) MIF(Management Information
 Format), CMIP(Co-
 mon Management Information Protocol)
 GDMO(Guidelines for the Definition of
 Managed Object) MIB RFC
 TCP/IP
 가 MIB MIB-II
 [3],[4] , RFC 1213 .
 CIM .
 2. DMI MIF
 DMI PC
 . DMI
 DMTF ,
 . DMI
 ,
 . DMI 가
 . Serviced Layer, MIF DB, MI(Management
 Interface), CI(Component Interface)
 [5].
 • (MIF)
 MIF
 . MIF
 , MIF ID
 •
 가 MIF
 ,
 MIF 가
 (Abstract Syntax Notation.1) ASN.1 SMI(St-

MO

(CI) 가

CI MO CMIP

MIF GDMO ASN.1

Set MIF Get C++ MO

Event GDMO ASN.1

(MI)

MI

MI

Get Set DMI

가 List

4. DMTF CIM

CIM DMTF

DMTF

DMTF, CIM

3. CMIP GDMO

CMIP(Common Management Information Protocol)

TMN(Telecommunications Management Network) OSI(Open System Interconnection)

[6]. CMIP가

가. DMTF

1992 DMTF

DMTF

(Specification)

(alarm) 가

CMIP 가

request가 M-GET, M-

GET response가

GET, SET

. ACTION

(bell)

. NOTIFICATION 가

GDMO MO(Managed Objects)

DMTF CIM, WBEM(Web-Based Enterprise Management), DMI, DEN(Directory Enabled Network), ASF (Alert Standard Format), SMBIOS(System Management BIOS) (1), ASF (low-level)

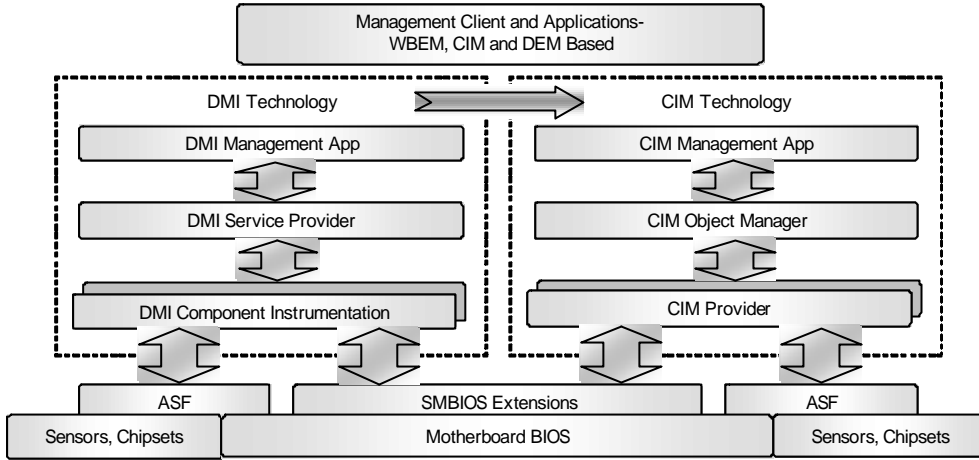
가 DMI CIM

가

. DMTF DMI

CIM/WBEM

[7].



(1) DMTF

. CIM

CIM

(entity)

. CIM

end - to - end

[8].

CIM



(2) CIM

2) CIM

III. CIM

CIM Specification

[9]. CIM

CIM

가
가

MOF

MOF

MIB

GDMO

. MIF,

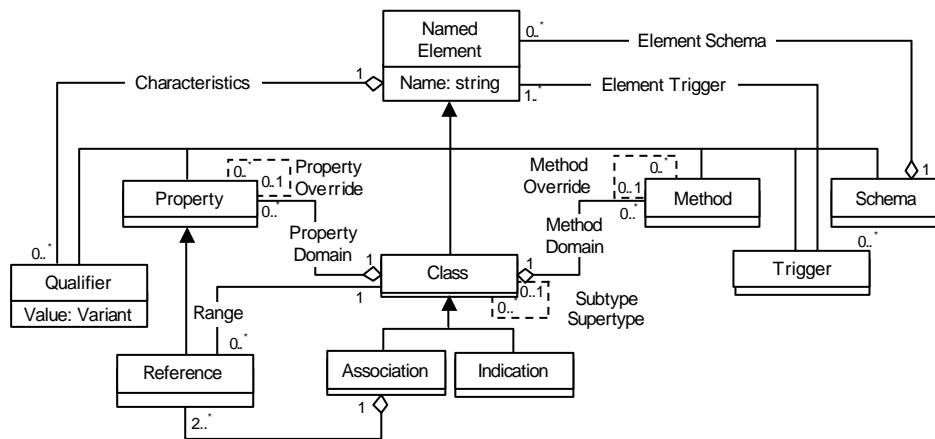
CIM

(core model)
(common model)

CIM

1. Mete Schema

- Method
- Trigger
- property (, ,)
- Indication Trigger properties methods 가
- Association reference Non-association 가 가
- Reference Association Association
- Qualifier Named elements



(3)

2. MOF Components

(3) CIM UML

Qualifiers

Qualifier (classes, associations, indications, methods, method parameters, triggers, instances, properties or references) 가

qualifier , , , ,

qualifier . Qualifier 가

4가

- Meta Qualifiers

Meta qualifier 가

가 association

“ASSOCIATION”, 가 indication

“INDICATION”

- Standard Qualifiers

CIM

qualifier . Standard qualifier

qualifier가 . Association

qualifier

가 qualifier

, 가 qualifier

- Optional Qualifiers

Optional qualifier CIM

qualifier가 가

qualifier

- User - defined Qualifiers

가 qualifier

IDL(Interface Description Language)

MOF . MOF

MOF

. MOF

MOF

. MOF 가

CIM

가. Class Declarations

- Qualifiers of the Class

“[”, “]”

“, ” 가

- Class Name

- Superclass Name of the Class

Class name “:”

가 name-space

MOF superclass

- Properties

Optional

qualifier 가

- Methods

qualifier 가 . Optional

```

[abstract]
class Win32_LogicalDisk : CIM_Media
{
    [key]
    string Volume;
    [read]
    string DriveLetter;
    [read, Units( "kilo bytes ")]
    sint32 RawCapacity = 0;
    [write]
    string VolumeLabel;
    [Dangerous]
    Boolean Format([in] Boolean FastFormat);
    String Manufacturer = "Acme ";
};

```

namespace

"key" qualifier 가 properties 가 key property 가 key properties 가

. Associations Declarations

Association

. Associations

가 가 Association

• Qualifiers of the Association

"[", "]" , " , " . Association 가

• Association Name

Association

• Superclass Name of the Association

Association name " : "

• Association References

. Qualifier 가

• Additional Properties

가 property

• Methods

method

association

. CIM_

Dependency superassociation

CIM_LinkBetweenAandB association

```

[Association]
class CIM_LinkBetweenAandB : CIM_Dependency
{
    [Override ( "Antecedent ")]
    CIM_A Ref Antecedent;
    [Override ( "Dependent ")]
    CIM_B Ref Dependent;
};

```

association subassociation

가 Association namespace

"key" qualifier properties

. Instance Declarations

"instance of"

properties

. Property

qualifier , prop-

erty

```
class Acme_LogicalDisk: CIM_Partition
{
    [key]
    string DriveLetter;
    [Units( 'kilo bytes ')]
    sint32 RawCapacity = 128000;
    [write]
    string VolumeLabel;
    [Units( 'kilo bytes ')]
    sint32 FreeSpace;
};
```

```
instance of Acme_LogicalDisk
{
    DriveLetter = 'C';
    VolumeLabel = 'myvol';
};
```

properties

key properties

3. Object Naming

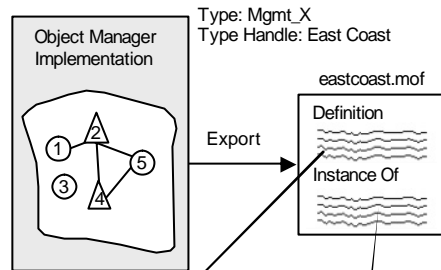
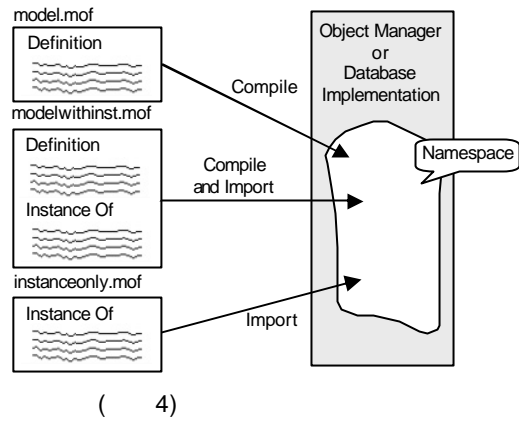
CIM

. CIM naming

Key qualifier

properties

CIM
 CIM MOF (4)
 MOF
 가



```
[ ]
class Fig_Circle
{
    [key] uint62 Name;
    string Color;
};
class Fig_Triangle
{
    [key] uint62 Label;
    string Color;
    uint32 Area;
};
[Association] class Fig_CircleToTriangle
{
    Fig_Circle REF ACircle;
    Fig_Triangle REF ATriangle;
};
[Association] class Fig_Covers
{
    Fig_Triangle REF Overt;
    Fig_Triangle REF Under;
};
Instance of Fig_Triangle (Label=2; Color="Blue" Area=12);
Instance of Fig_Triangle (Label=4; Color="Blue" Area=12);
Instance of Fig_Circle (Name=1; Color="Blue");
Instance of Fig_Circle (Name=3; Color="Blue");
Instance of Fig_Circle (Name=5; Color="Blue");
Instance of Fig_CircleToTriangle
{ ACircle = "Circle.Name=1"; ATriangle = "Triangle.Label=2"; };
Instance of Fig_CircleToTriangle
{ ACircle = "Circle.Name=3"; ATriangle = "Triangle.Label=2"; };
Instance of Fig_CircleToTriangle
{ ACircle = "Circle.Name=5"; ATriangle = "Triangle.Label=4"; };
Instance of Fig_Covers
{ Overt = "Triangle.Label=2"; Under = "Triangle.Label=4"; };
```

(5) MOF Export

MOF

key qualifier

namespace

(5) MOF 가 MOF

○ Naming CIM Objects

CIM

key qualifier properties 가 .

, CIM

“Namespace Path” CIM

“Model Path” .

• Namespace Path

“namespace type” . CIM

“namespace handle”

- Namespace Type MIB, MIF GDMO 가 CIM

. Namespace type API DMTF 가 . OGSA, TeleMan-

- Namespace Handle HPI DMTF Alliance Partnership AIS

namespace 가 DMTF

, namespace CIM 가

• Model Path

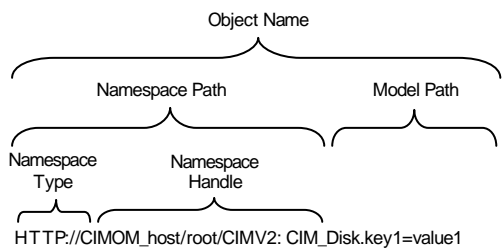
Key qualifier properties

가 .

weak , model path

key properties . CIM

(6)



(6) Object Naming

[1] “The Growing Importance of Management Standards,” DMTF Technical Note, 2003. 9., http://www.dmtf.org/education/technote_Management-Standards.pdf

[2] David PerKins and Evan McGinnis, “Understanding SNMP MIBs,” Prentice Hall PTR, 1997.

[3] M. Rose and K. McCloghrie, “Management Information Base for Network Management of TCP/IP-based Internets: MIB-II,” RFC 1213, 1991.

[4] M. Rose and K. McCloghrie, “Structure and Identification of Management Information for TCP/IP-based Internets,” RFC 1155, 1990.

- [5] "DMTF Organization Backgrounder," <http://www.dmtf.org/standards/documents/DMI/DSP0001.pdf>
- [6] "The Common Management Information Services and Protocols for the Internet(CMOT and CMIP)," RFC 1189, <http://www.ietf.org>
- [7] "DMTF Standards and Terminology," DMTF Technical Note, 2003. 6., http://www.dmtf.org/education/technote_Standards.pdf
- [8] "The Value of the Common Information Model," DMTF Technical Note, 2003. 6., http://www.dmtf.org/education/technote_WhyCIM.pdf
- [9] CIM Specification V2.2, June.