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Research on the OID (Object Identifier) Resolution System

Ning KONG

June, 2009



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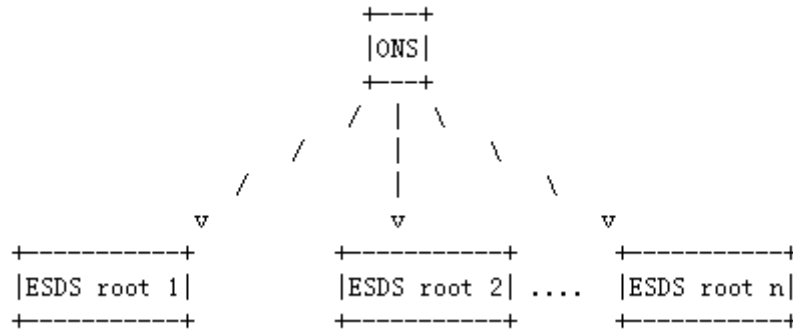
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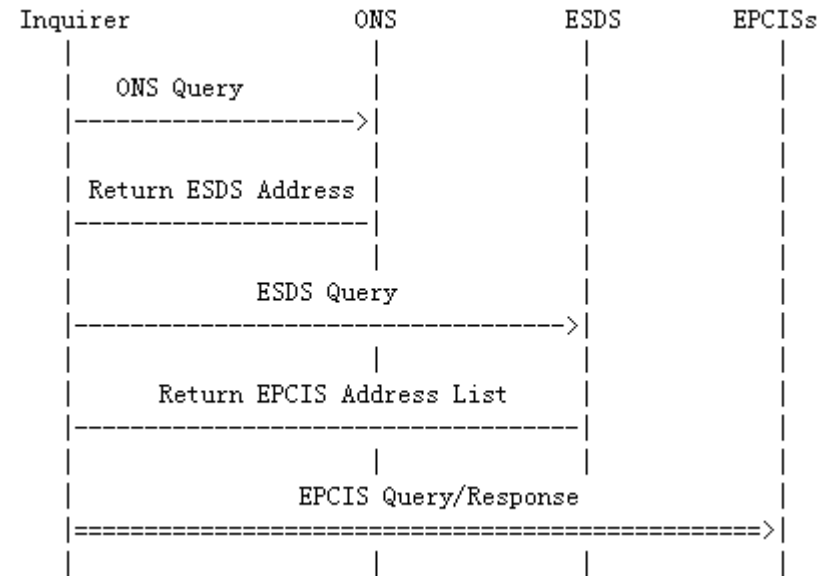
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- As the member of EPCglobal China to research the EPC (Electric Product Code) standards.
 - ✓ EPC IS (EPC Information Services)
 - ✓ EPC ONS (EPC Object Name Service)
 - ✓ EPC DS (EPC Discovery Service)
- ✓ Cooperation with NIDA (National Internet Development Agency of Korea) to study multiple IDs Resolution by using OID.

- The draft about ESDS of IETF;
 - ✓ Object Naming Service (ONS) Extension for Extensible Supply-chain Discovery Service (ESDS), October 2008



The relationship between the ESDS and ONS



The working flow of the query for ESDS

- Attended the ITU-T JCA-NID meeting, and CJK meeting to communicate OID related technology with Korean and Japanese experts;
- Discussed and modified the following ITU-T drafts with NIDA, ETRI and YRP UNL
 - ✓ ID schemes for multimedia information access triggered by tag-based identification
 - ✓ ID Resolution Protocols for Multimedia Information Access Triggered by Tag-based Identification

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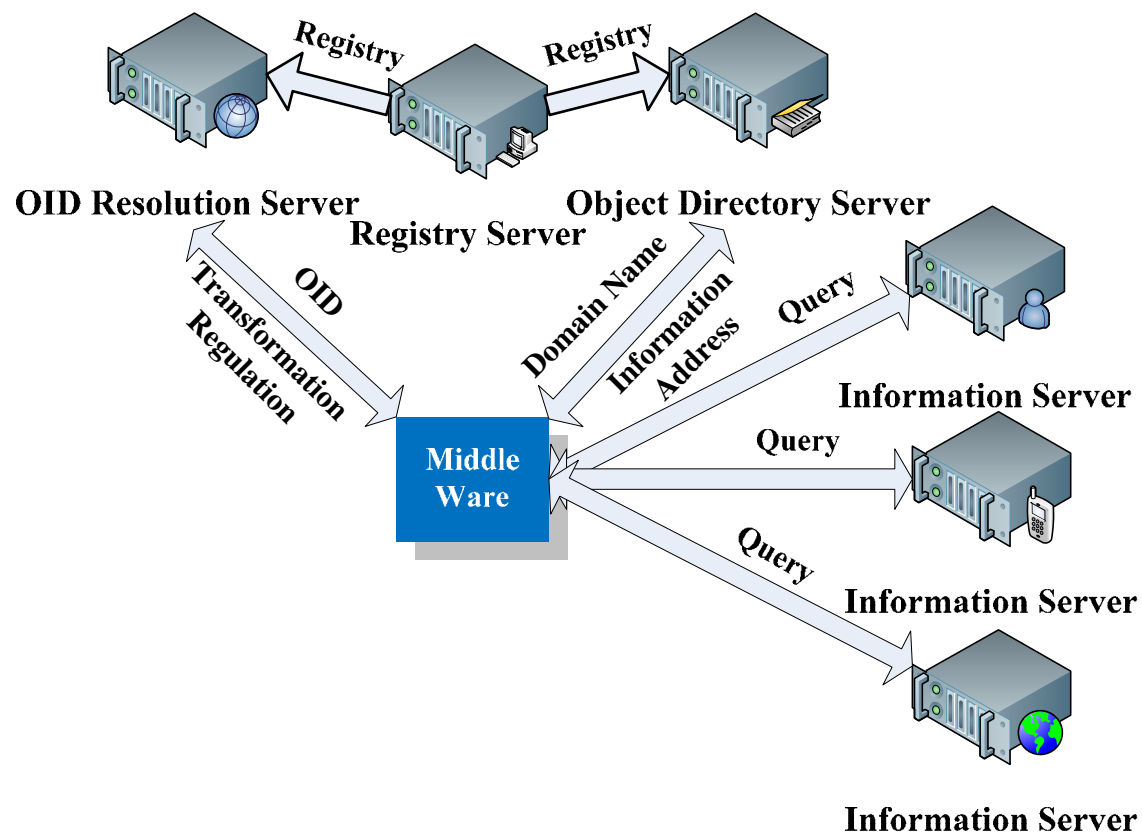
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The Architecture of OID Resolution System



The Architecture of OID Resolution System

- Put forward the method of the Regular Expression Resolution Method for the transformation regulation of the multiple IDs;
 - ✓ It can handle the 2 types of code (Simple and Multiple) by the Simple Descriptive Mechanism (S-DM) and the Distributed Descriptive Mechanisms (D-DM).

<Simple Code Type>

“Just one row constitution”

For example : EPC

8bit	10bit	10bit	10bit
Header	Company	Item	Serial

<Multiple Code Type>

“Multi-row constitution”

For example : uCode, mCode

5b	5b	5b	5b	5b
Class A	Company	Item		
Class B	Company		Item	
Class C	Company		Item	Serial

$S_DM_Expression = !^{\wedge}(. \{Length_1\})(. \{Length_2\})...(. \{Length_M\})...(. \{Length_N\})\$! \backslash I . \backslash J \backslash K !$

$D_DM_Expression = !^{\wedge}(. \{Length_1\})(. \{Length_2\})...(. \{Length_I\})...(. \{Length_N\})\$! \backslash I !$

- ✓ Made a co-test for the research on the OID resolution system.

OID RFID Code

Result

```
FQDN : 129,174,simplecode,tnsroot,cn
Version : 9,
Length : 8,8,8
Convert : 9
Tail : simplecode,tnsroot,cn
```

OID RFID Code

Result

```
FQDN : 129,174,simplecode,tnsroot,cn
Version : 9,
Length : 8,8,8
Convert : 9
Tail : simplecode,tnsroot,cn
```

Queries sent	10,000 queries	50,000 queries	100,000 queries
Test 1 (Response time)	475.141062	2286.886509	4471.679003
Test 2 (Response time)	482.371473	4012.113110	7916.231523

Modified the Regular Expression Resolution

- Modified the Regular Expression Resolution Method, and put forward the Centralized Descriptive Mechanisms (C-DM) for the transformation regulation which only needs once DNS query.
- ✓ Ning Kong, Xiaodong Li, Baoping Yan, A Model Supporting Any Product Code Standard for the Resource Addressing in the Internet of Things, ICINIS 2008, EI Compendex.

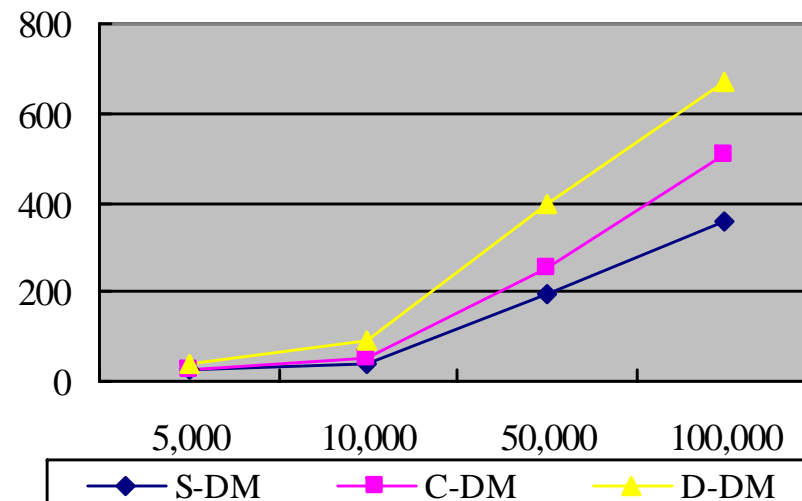
$$C_DM_Expression = !^{\wedge}(. \{Length_1\})(. \{Length_2\})... \\ (. \{Class_Field\})...(. \{Length_N\})\$!\backslash I. \backslash J.... \backslash K!$$

Modified the Regular Expression Resolution

- Made a test for the performance of the modified Regular Expression Resolution Method.

Sum Type	5,000	10,000	50,000	100,000
S-DM	24.35	39.19	192.90	357.20
C-DM	29.03	54.66	252.46	504.88
D-DM	40.69	93.94	396.37	673.14

The data of the performance test



The performance comparisons for the three transformation regulation descriptive mechanisms

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- Made the liquefied gas information query system for Shanghai by the mechanism of the OID Resolution System.



- Made a demo system for the multiple IDs query by the mechanism of the OID Resolution System.

用户注册
忘记密码

用户名 密码 登录

■ 首页 ■ 注册物品域名 ■ 管理物品域名 ■ 用户面板

WHOIS
目前还不支持 查询

帮助中心

域名注册向导
GO

常见问题
GO

该系统为CNNIC用于物品域名注册试验的平台，采用了EPP国际标准协议。

☒ 字符码 (如 zhangsan)
☐ 数字码 (如 1.2.156.135246)
☐ 一维条码 (如 531ABUV)

顺序码 (可选) (如 000081772)
000010110110001

查询

OID码 (如 0.86.29.1)
Code码 (如 00000001001011100111010110101101)
读取 查询

ICANN
Accredited Registrar

中国互联网络信息中心
CNNIC

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- To develop a high performance DNS system for OID resolution system.
- To research the DNSSEC (DNS Security Extensions) to improve the security of the OID resolution system.
- To make further co-test for the OID resolution system with many other international institutes.

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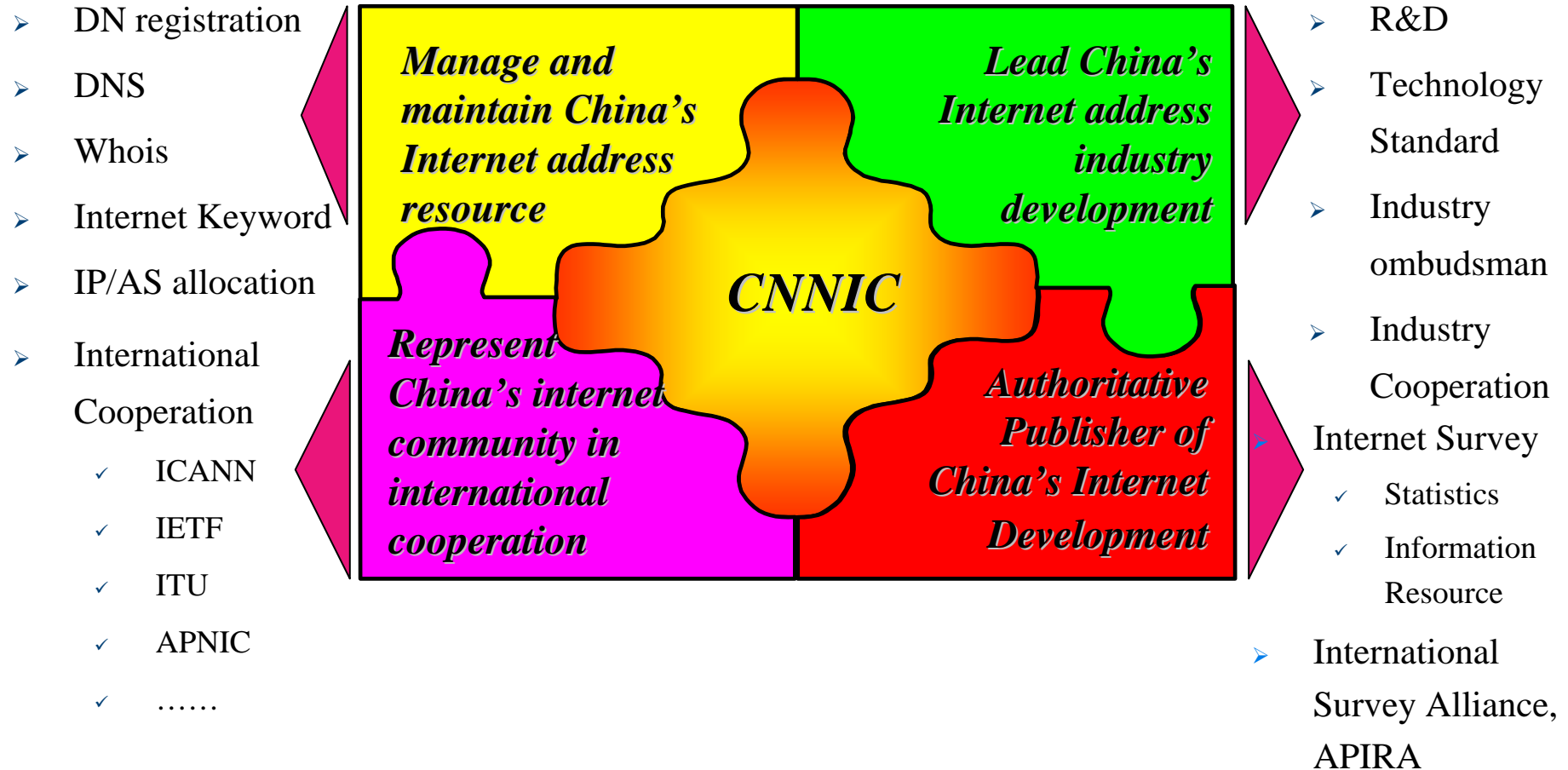
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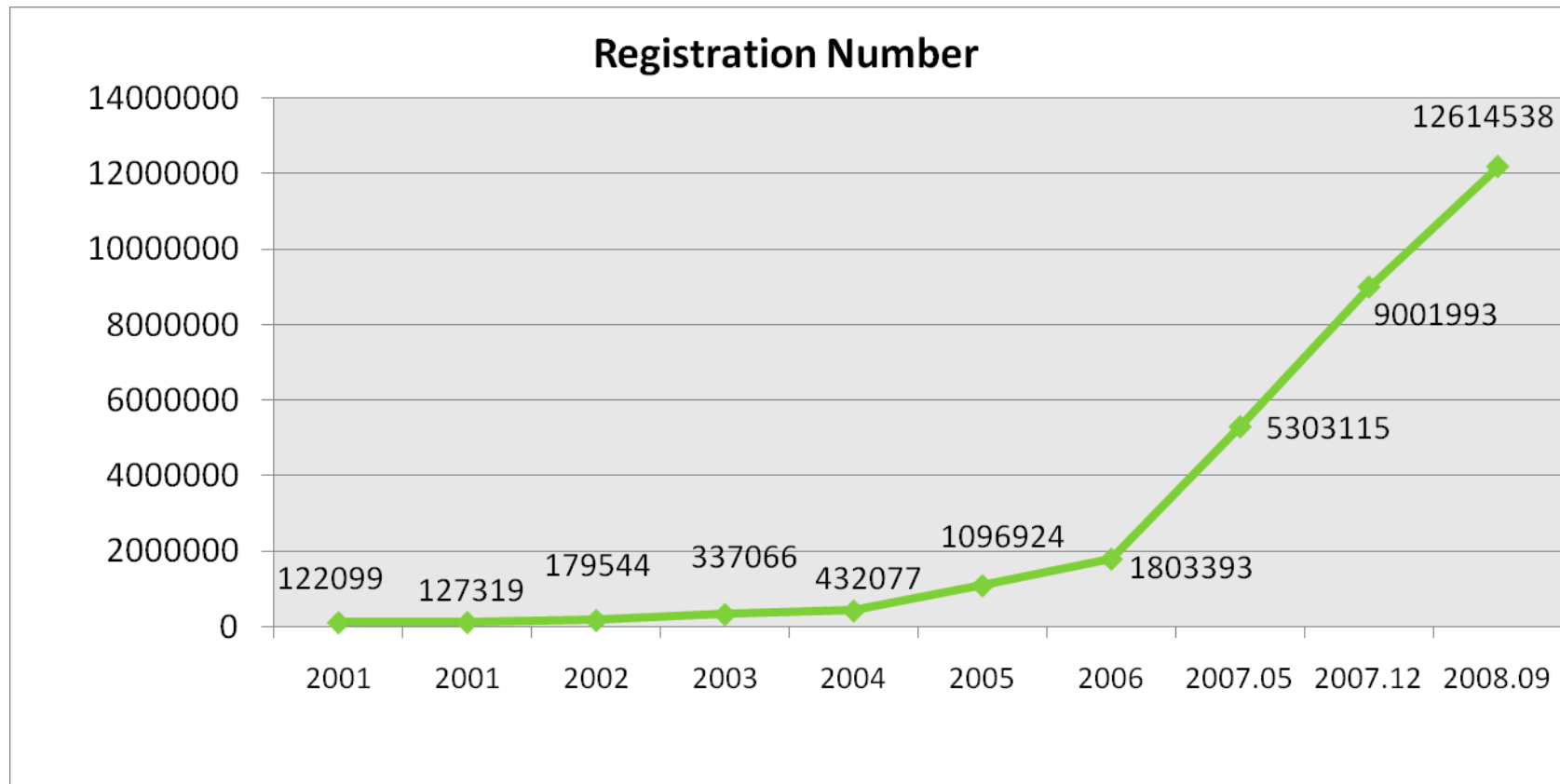
5 **Appendix: The Introduction of CNNIC**

- CNNIC (China Internet Network Information Center)
 - ✓ CNNIC is the state network information center of China and a non-profit organization;
 - ✓ CNNIC takes orders from the Ministry of Industry and Information Technology to conduct daily business;
 - ✓ Computer Network Information Center of Chinese Academy of Sciences takes the responsibility of running and administrating CNNIC;
 - ✓ CNNIC Steering Committee supervises and evaluates the structure, operation and administration of CNNIC.

The Functions of CNNIC



.CN registration over 12.6 million, rank No. 1 of all ccTLDs.



- Technical Researches on Internet Addressing
 - ✓ High Performance DNS (Domain Name System)
 - ✓ RFID (Radio Frequency Identification) & IOT (Internet of Things)
 - ✓ ENUM (E.164 NUmber Mapping)
 - 86(6.8.e164.arpa)
 - ✓ IDN (Internationalized Domain Names)
 - RFC 3743
 - RFC 4713
 - ✓ EAI (Email Address Internationalization)
 - RFC 5336



www.cnnic.cn