Update on Techniques and Standards

Ning Kong
Agenda

1 Global Service Platform

2 CNNIC DNS Solutions

3 RDAP Standards & Open Source Software
Built 32 global service nodes which cover the main operators in China, Asia-Pacific, Europe and North America. Altogether 61 domain monitoring nodes in global.

Work in 2015

- Successfully finished the simulation of disaster recovery.
- Successfully completed the ERERO exercise.

.baidu passed pre-delegation testing and was authorized by the root.

CN 16,363,594, 中国 352,785

SLA keeps 100%

2015.10, QPD is 9.171 billion (.CN),

Attacks Number (From 2014): 100+

Peak QPS: 1.6 million
2014.10.27

Status

Platform

Work in

2015
Testing Cloud
- Constructed for staffs in CNNIC (developers)
- Multi-tenant and isolation
- Self-service for resource

Service Cloud
- The services hosted in VM
- Fast-deployment
- VM migration
- Easier to manage

Registration Cloud
- Help DNS service provider
- High performance
- Lower the threshold for service providing
- New business mode

Resolving Cloud
- DNS resolving service in cloud
- More flexible
- More reliable
- Strong scalability

Private Cloud

Public Cloud

These cloud platform is building in progress
1. Global Service Platform
2. CNNIC DNS Solutions
3. RDAP Standards & Open Source Software
General Introduction of CNNIC DNS System

- Monitor system
- Recursive DNS
- Traffic monitor system
- DNS specialized firewall
- ccTLD name server
- NewG TLD escrow service
- Domain name server at other levels
- Cloud platform for domain escrow service
- DNSSEC signing service
- HSM management service
- Data management service
- CookDNS
**Zebra 3**
- An authoritative DNS software
- Support DNS & DNSSEC lookups

**DNS-D/DNS-Prime**
- Specialized anti-attack device based on DNS packet analysis
- Support both hardware and software firewalls

**All-In-One DNS Device**
- Integrate DNS service and anti-attack function

### CNNIC DNS Solutions
- **heterogeneous software architecture**
  - Zebra3
  - BIND9
  - NSD

### Resolver
- 1.2.4.8

### Anti-attack devices (DNS-D/ DNS-Prime)
- sina.
- Baidu.
- COM.
- GOV.
- WWW.
Advantages of CNNIC DNS

**Zebra 3**

- Zebra3 outperforms BIND9 about 10 times in QPS
- Zebra QPS keeps stable in various testing conditions

**SDNS-D**

- 40 Gigabit wire-speed one port
- Traffic control for every IP and Domain
- Specialized DNS packet feature detection

**DNS-prime**

- 10 Gigabit wire-speed one port
- Support domain/ip whitelist
- Low cost
- Specialized DNS packet feature detection

**All-In-One DNS Device (in progress)**

- High performance DNS service (400,000 + QPS)
- Built-in anti-attack function (10 Gigabit wire-speed one port)
- Easy deployment
CNNIC is developing next generation DNS software:

- Support both authoritative and recursive service
- New architecture, super high performance
  - 10,000,000 QPS for authoritative name server
  - 10,000,000 QPS for caching server

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**Zebra 4 (In Progress)**

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**Frame 1: 88 bytes on wire (704 bits), 88 bytes captured (704 bits)**

- Ethernet II, Src: Intel_84:12:cf (90:e2:ba:84:12:cf), Dst: Performa_00:00:02 (00:10:94:00:00:02)
- Internet Protocol Version 4, Src: 192.168.100.2 (192.168.100.2), Dst: 192.168.100.93 (192.168.100.93)
- User Datagram Protocol, Src Port: domain (53), Dst Port: 1024 (1024)

**Domain Name System (response)**

- Transaction ID: Oxf5ca
- Flags: 0x8500 Standard query response, No error
- Questions: 1
- Answer RRs: 1
- Authority RRs: 0
- Additional RRs: 0

**Queries**
- abT6\333.cn: type A, class IN

**Answers**
- abT6\333.cn: type A, class IN, addr 1.1.1.1
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• IETF WEIRDS (Web Extensible Internet Registration Data Service) working group was formed on May 16, 2012

• The WG aims to:
  • Standardize a single data framework
  • Use standard features of HTTP to support differential service levels to different classes of user
  • Produce a simple, easy-to-implement protocol that supports internationalized registration data

• IETF RFC
  • RFC7480-RFC7485
  • CNNIC is the author of RFC7480, RFC7481 and RFC7485
CNNIC and ICANN executed the collaboration agreement for development of a RESTful WHOIS open-source server in 26th Oct, 2012.

• CNNIC assumed the exclusive role of open source RESTful WHOIS development program.

• The RESTful WHOIS server has been implemented according to the RDAP standards to meet the needs of the community.
- Modular Design
  - Clear structure
  - Reusable component
  - Easy maintenance
- Layered Design
  - Extensibility
• Project information
  – http://github.com/cnnic/rdap
  – We have finished Version 1.0.
• License
  – FreeBSD
The REGEXT working group is the home of the coordination effort for standards track of EPP and RDAP extensions.

An extension to EPP object mappings which is designed to support assigning a reseller to any existing object (domain, host, contact) as well as any future objects.

- draft-zhou-eppext-reseller-02
- draft-zhou-eppext-reseller-mapping-02

An extension of EPP domain name mapping for the provisioning and management of bundling registration of domain names.

- draft-kong-eppext-bundling-registration-02
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