



Implementing a Registry System – SGNIC's Experience

Presented by Lim Choon Sai
General Manager, SGNIC

Outline

- Overview and Roles
- Brief History
- Present State
- Registry-Registrar Models
 - Model 1: Technical System Outsource
 - Model 2: Total Registry Outsource
- Pricing Models
 - Model 1: Traditional Fixed Price
 - Model 2: Co-Revenue Sharing
 - Model 3: Tier Pricing
- New Registry Features
 - Custom EPP 1.0 toolkit
 - DNS Anycast
 - DNSSEC & IPv6

Overview and Roles

- National Registry for .SG Domain Names
- Operates the '.SG' top-level system domain name system
- Administers the registration of second-level (.sg) and third-level (.com.sg, .org.sg, .net.sg, .edu.sg, .gov.sg, .per.sg) domain names
- Formulates and implement registration policies for '.SG' domain names

Brief History (1)

- Early 1990s
 - .SG namespace administered by National University of Singapore TechNet Unit
 - Manual registration via snail mail
- October 1995
 - SGNIC was formed to take over the .SG namespace
 - Manual registration via snail mail
- July 1997
 - SGNIC Pte Ltd was formed as a subsidiary of National Computer Board
 - Manual registration via snail mail

Brief History (2)

- December 1999
 - SGNIC Pte Ltd became a subsidiary of IDA
 - Manual registration via snail mail
 - Online registration via Integrated Registry System (batch processing, delayed registration)

- January 2003
 - SGNIC commissioned the new Registry-Registrar System (SgR2R)
 - Online registration of domain name via SGNIC registrars (realtime registration)

Present State

- Current registry-registrar system has reached End-of-Life (EOL) after 5 years of service
- Need to incorporate new features to better support SGNIC interfacing with registrars to improve the overall performance of registration process
 - EPP 1.0
 - DNS Anycast
 - DNSSEC

Registry-Registrar Models (1)

- Model 1: Technical System Outsource
 - The appointed system vendor deals with SGNIC, its registrars, registrants and the public on any technical queries and troubleshoot all system faults
 - SGNIC performs administrative functions (policy matters, billing and invoicing etc) as well as retains ownership and effective control over daily operations

Registry-Registrar Models (2)

- Merits
 - Better communications, support and fast response to issues raised by registrars, registrants and the public with SGNIC established as the central authority
 - Lack of technical personnel
 - Effective control over daily operations

- Key Issues
 - In-house minimal technical expertise required by the Registry to oversee the management and maintenance of the system hardware and software
 - Cost involved in administering registrars and its resellers by the registry

Registry-Registrar Models (3)

- Model 2: Total Registry Outsource
 - The appointed system vendor operates the registry and it must comply with SGNIC's policies, security requirements and Service Level Agreements (SLA)
 - SGNIC performs administrative functions such as policy matters, billing and invoicing etc. SGNIC will own all domain name data but the registry system (hardware and software) will be owned and operated by the appointed system vendor

Registry-Registrar Models (4)

- Merits

- Dedicated expertise in different function areas i.e. SGNIC takes care of policy matters while the appointed system vendor takes care of the daily operations of the registry system
- Technology update and system enhancement taken care by system vendor

- Key Issues

- Measures to be in place to continue operations temporarily if the system vendor defaults
- Measures to keep abreast of daily registry operations
- Contractual arrangement and regular bidding process to select an outsource operator

Pricing Models (1)

- Model 1: Traditional Fixed Price
 - The appointed system vendor charges a one-time fee for the system hardware and software
 - A maintenance contract is also required to be negotiated with the system vendor

Pricing Models (2)

- Merits
 - Fixed one-time fee for the registry system hardware and software
 - Annual operating cost for lifespan of system can be determined in advance

- Key Issues
 - High upfront costs
 - Registry operator to be responsible for technology obsolescence and system enhancement

Pricing Models (3)

- Model 2: Co-Revenue Sharing
 - The appointed system vendor builds the system and bills the registry *based on the number of the domain names registered*

Pricing Models (4)

- Model 3: Tier Pricing
 - The appointed system vendor builds the system and bills the registry *based on the number of the active domain names hosted in the system*

Pricing Models (5)

- Merits
 - Quick set up of registry with minimum or no resources
 - Minimal or no capital outlay required
 - Commitment and motivation from appointed system vendor to help the registry grow

- Key Issues
 - Operating cost depends on the number of domain name registrations

New Registry Features (1)

- Custom EPP 1.0 toolkit
 - New registry system will use a custom EPP toolkit based on the version 1.0 schema for communications with SGNIC registrars
 - EPP commands incorporated and customized for the .SG namespace, such as the reservation of domain names, ability to cater for upfront rebates to registrars etc
 - Improve the performance of the domain reservation process by eliminating the need to connect to a third-party system

New Registry Features (2)

- DNS Anycast
 - A network addressing and routing scheme whereby data is routed to the "nearest" or "best" destination as viewed by the routing topology
 - The new .SG Domain Name System will make use of a primary and secondary DNS Anycast network setup. Setup does not rely on any single vendor to provide critical DNS services thus eliminating a single point of failure

New Registry Features (3)

- DNS Anycast
 - Improve the performance of the DNS in terms of query response time by distributing the load across multiple geographically dispersed servers
 - Provide increased resiliency against cyber attacks such as Distributed-Denial-of-Service (DDoS) attacks

New Registry Features (4)

- DNSSEC & IPv6
 - DNS Security Extensions are a suite of IETF specifications for securing information provided by the DNS.
 - DNSSEC provides the following to DNS Clients:
 - Origin authentication of DNS data
 - Data integrity
 - Authenticated denial of existence of DNS data
 - The new .SG Domain Name System shall support DNSSEC and Internet Protocol version 6 (IPv6).



THANK YOU!