Nominum DNSSEC Solutions Overview
ralf.weber@nominum.com
# Nominum

## Making the Internet better through DNS

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<th>Corporate Resume</th>
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| Dr. Paul Mockapetris  
Invented the DNS in 1983 | Range of solutions addressing business needs | Broadest network coverage – over 500 million end users |
| Bob Halley  
Architect of BIND8 and BIND9 | In-Net, Off-Net, Combined offerings | Industry-leading performance |
| Ted Lemon  
Developer of ISC DHCP  
Over 30 Internet and networking standards authored or co-authored | Hosted Network Services | No restart for any configuration change |
|                 | Consumer Applications | Multiple layers of security |

## Nominum is building the new Internet based on proven infrastructure

Just a few of our more than 140 customers representing over 30% of the world’s Internet traffic

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Product Overview

• Software systems
  – ANS and ANS Premier
  – Vantio and policy software modules
  – Centris
  – DCS
  – Navitas

• Hosted Systems
  – Skye Resolution
  – Skye Authority
  – Skye Network Protection service
Authoritative Name Server/Premier (ANS/P)

Software-only solution for authoritative DNS

- Proprietary database
  - Scales to millions of names, zones, and records
- High performance
  - Over 100K QPS with millisecond latency
  - On-the-fly DNS zone updates without requiring server restart
  - Fast reload time even with the highest number of resource records
- Full compliance with DNSSEC standards
  - Automated DNSSEC lifecycle management
- Rich management layer
  - SOAP/XML APIs
  - SNMP and Alarms
  - Command Line Interface
  - Web GUI
  - Command Channel APIs (C, Java, Perl, Python)
ANS/P Intelligent DNS System

Beyond a simple authoritative name server

- **Intelligence & Admin**
  - External Communications and APIs
  - Network Visibility and Event Awareness
  - Automated Signing/Resigning & Key Management
  - DNSSEC
  - Version Control (Backup)
  - Journaling (Recovery)
  - Zone Templates
  - Zone Transfer
  - DDNS
  - Multimastering
  - High Performance Proprietary Database (vDB)

- **Security**

- **Data & Storage Management**

- **Protocol**
  - IPv4
  - IPv6

- **Intelligent DNS System**

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Demand Visibility and Awareness

• Without visibility, you’re flying blind
• Create events and/or alerts based on DNS attributes

- Include or exclude any of the below:

  |- client-address     | domain | local-address | query-class | regex-name |
  | client-network     | Flags  | local-port   | query-id    | result-code |
  | client-port        | ip-version | name         | query-type  | view |

• Set duration, high and low watermarks for alerts
• Alert via SNMP, syslog or command channel event
• Graphical Reporting
ANS/P and DNSSEC

Vital functionality for today’s domain owners

• Challenges
  – Database size can increase by 6x or more
  – Key Administration
  – Managing Signing of Zones
  – Updating Zones When Data Changes
  – Administration, Administration, Administration!!

• The solution - Nominum DNSSEC Packs
  – Administrative bundle that manages DNSSEC lifecycle automation
  – All activities done via single command utility
  – “DNSSEC Made Easy”
    • Integration of all DNSSEC functions
    • Complete automation
    • No change to data interface
ANS/P real world examples

• Securing a zone
  - `ans_dnssectool create-pack --name initial example.com`

• Issuing a key rollover
  - `ans_dnssectool rollover-zsk --name santa-claus-zsk \ --start 20101206123400 example.com`

• You can provision multiple ZSK key rollovers that all will be stored in the database and executed appropriately
Vantio Intelligent DNS System
More than a Simple Caching DNS Server

- Policy
  - NXR
    - Load Balanced Redirect
    - Automatic Feedback
    - SLK/MLK Redistribution
    - Dynamic Redirection
    - Dynamic Exclusion

- MDR
  - Reporting
  - On-Demand Updates
  - Confidentiality
  - Dynamic Provisioning
  - Categorization
  - Monitor
  - Block
  - Whitelisting

- UAR
  - View-Specific Policy
  - Dynamic View Selection
  - Scalable Views
  - Whitelist Exclusions

- Intelligence
  - Inspection Engine
  - Dynamic Priority Assignments
    - Opt In
    - Opt Out
  - Visibility & Awareness

- Advanced DNS
  - Recursive Resolution – Query Processing Algorithms
  - Fast Path Processing

- Security
  - Proprietary Database
  - DNS Cache
    - IPv4
    - IPv6
  - DNSSEC
  - TA Management

- Layered Caching Security
Vantio real world examples

• **Adding the root key**
  
  ```
  view.managed-keys-set name=world domain=. initial-keys='(257 3 8
  AwEAAagA……
  ```

• **Even easier with supplied script that downloads and verifies it**
  
  ```
  getrootkey4vantio.py
  ```

• **Temporary disable validation for a domain**
  
  ```
  view.update name=world negative-trust-anchors+=(example.com)
  ```

• **Inspect a record in the server**
  
  ```
  vantio> inspect name=www.denic.de
  {
    type => 'inspect'
    view => 'world'
    name => 'www.denic.de.'
    exists => '1'
    types => {
      A => {
        exists => '1'
        ttl => '84584'
        data => ('81.91.170.12')
        trust => 'proven-insecure'
        origin => '2001:608:6:6::11'
      }
    }
  }
  ```
Comcast DNSSEC Deployment

• Most advanced DNSSEC deployment in the world

• DNSSEC enabled on all Vantio servers nationwide
  - Will sign all 5,000 managed domains by Q1/2011

• 100% Nominum Solution
  - “we have been working closely with our vendor to make sure the tools were easy to use and that it was not an onerous process.” – Jason Livingood (Executive Director of Internet Systems Engineering)
Nominum Global Network

Worldwide network for full service DNS

- The network
  - Highly redundant global network
    - Multi-Tier-1 ISP connectivity
    - Fully redundant, industry-best network elements
    - Carrier-class data centers
  - Site-level service redundancy and load balancing
  - Anycast architecture
  - State-of-the-art security
  - Full DNSSEC compliance

United States
- Seattle
- San Francisco
- Dallas
- Chicago
- Washington, DC

International
- Toronto
- Sao Paulo
- Hong Kong
- Vienna
- London
- Madrid
SKYE Resolution

On-demand caching DNS capacity

Hosted caching DNS service offering that seamlessly extends the capacity and resilience of in-network caching DNS infrastructure

- Three implementation options
  1. Total DNS offload
  2. Virtual network extension
  3. Disaster recovery service

- Three configuration options
  1. Client configuration
  2. Load Balancer
  3. IP Anycast
## SKYE Authority Hosted DNS Service

### Proven 100% DNS Uptime & Fast Resolution
- Highly available, high speed, anycast DNS network with 13 datacenters world-wide
- Nominum anycast network routes user requests to the closest datacenter

### DDoS Protection
- Multi-layered security protection (software, network) to pro-actively mitigate heavy DDoS attacks

### Automated DNSSEC
- Automated zone signing eliminates complexity associated with DNSSEC roll-out

### Real-time Visibility and Control
- iView service offers complete visibility into the DNS traffic
- APIs to automatically create and manage zones that can integrate with your own portal

### Lower TCO
- Save on additional server, network hardware, maintenance as well as operational costs associated with bandwidth, power, space, cooling.
Questions