

# **OARC Status**

**Keith Mitchell**

**OARC Programme Manager**

**Internet Systems Consortium**

**OARC Workshop**

**Seattle, 16<sup>th</sup> Nov 2006**



# OARC Secretariat Presentations

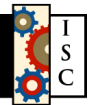
## Thu 16<sup>th</sup> Open Session

- OARC Introduction and History
- OARC Current Status

## Fri 17<sup>th</sup> Closed Session

- OARC Evolution and Future
- Questions for Members
- Discussion

# **OARC Introduction and History**



# What is ISC?

- Internet Systems Consortium, Inc.
  - Headquartered in Redwood City, California
  - 501(c)(3) Nonprofit Corporation
- Mission:
  - To develop and maintain production quality Open Source software, such as BIND and DHCP
  - Enhance the stability of the global DNS through reliable F-root nameserver operations and ongoing operation of OARC
  - Further protocol development efforts, particularly in the areas of DNS evolution and facilitating the transition to IPv6



# What is OARC ?

- Operations, Analysis and Research Center for the Internet
- Co-ordination centre to protect Global DNS infrastructure
- Trusted, neutral environment for operators and researchers to:
  - gather and share data
  - co-ordinate response to attacks
- Secretariat run and managed by ISC

# Keith's Background

- Internet operations and development since 1986
- Founder and CTO of UK's first commercial ISP, *PIPEX* 1992-1996
- Founder and Executive Chairman of London Internet Exchange, *LINX* 1994-2000
- Founder and Director of *Nominet UK* 1996-2002
- Chair of *RIPE NCC* Executive Board 1998-2000
- Founder and CTO of pan-European commercial IXP operator, *XchangePoint* 2000-2004
- Chair of *UK Network Operators' Forum* 2005-
- Moved to US (Cleveland OH) Q2 2006-



# OARC Mission

- Provide trusted channels for Internet incident reporting and handling
- Facilitate confidential sharing of DNS operations data
- Interface with research community for analysis and publication
- Outreach to vendors, end-users and law enforcement

# OARC Motivation

- DNS infrastructure makes everything work as expected
- DNS outage of any network service provider or large content provider affects everyone using the Internet
- Growing resource demand for Internet:
  - abuse prevention
  - infrastructure protection
  - operational co-ordination

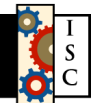


# OARC Motivation

- Increasing incidence of attacks against the DNS, e.g.
  - Microsoft outage in 2001
  - DDoS attack on Root Servers 2002
  - Open recursive resolvers Q1 2006
  - register.com Oct 2006
- DNS increasingly implicated in and compromised by Botnet activity

# OARC Core Functions

- Incident Reporting
  - Custom member-only “bulletin board”/ticket sharing
- Operational Co-ordination
  - Open and trusted mailing lists
  - Secure jabber infrastructure
  - Regular meeting
- Data Gathering
  - Real-time and “48-hour snapshots”
  - Policies and practises
- Analysis
  - Tools and server resources
  - Characterize ‘normal’ traffic and identify threats early



# OARC History

- Founded 2004
- Agreement between ISC and CAIDA, funding from NSF
- Various contributors, volunteers, managers since then
  - more churn in these than has been ideal...
- Successful research and member workshop 2005
- DNS operations workshop summer 2006

# OARC Q4 2006 Objectives

- Keith fully on board since 1<sup>st</sup> October
- Organize Member/Researcher workshop
- Raise OARC profile
  - attended/presented at RIPE, NANOG, UKNOF, IEPG/IETF
- Outreach to new and existing members
  - solicit inputs on OARC's future direction
  - engage governance processes
  - define way forward
- Improve policy/procedure documentation



# OARC Current Status



# OARC Members

- Current total 37, includes:
  - 6 root server operators
  - 2 gTLD operators
  - 10 ccTLD operators
  - 10 DNS implementors
  - researchers at 5+ institutions
  - RIRs, DNS registrars, operators
- +3 pending members

# OARC Members

- Afillias
- AFNIC
- APNIC
- Autonomica
- *BFK*
- Cambridge Univ
- ChangeIP.com
- CIRA
- Cisco
- Cogent
- CZ.NIC
- Damballa
- DENIC
- eNom
- EP.net
- F-root
- Georgia Tech
- Google
- II-F
- Internet Perils
- ISC
- ISoc-IL
- Microsoft
- NASA Ames
- *NIC.CL*
- NIDA
- Nominet UK
- NTT
- *OpenDNS*
- PIR
- Registro.BR
- RIPE NCC
- Shinkuro
- Team Cymru
- UMR.edu
- NeuStar/  
UltraDNS
- UMD.edu
- WIDE



# OARC Participation Levels

- Category 1, *Normal* \$4,200 3 PoCs
- Category 2, *Expanded* \$6,800 5 PoCs
- Category 3, *Beneficial* \$In-Kind
- Category 4, *Supporting* \$10,000 8 PoCs
- Category 5, *Sustaining* \$25,000 12 PoCs
- Category 6, *Sponsoring* \$50,000 15 PoCs
- *Affiliate* Submit & Access data
- *Associate* Access data only
- *Contributor* Submit data only



# OARC Resources

- Keith Mitchell full-time Programme Manager
- April Lorenzen working part-time on Passive DNS
- Co-lo, admin, logistical support by ISC
- Equipment funded by NSF through CAIDA
- System administration by Paul Vixie with some help from ISC ops
- Various volunteers including:
  - Brett Watson (drupal, member support)

# OARC Websites

<http://oarc.isc.org>

- Public introductory material about OARC

<https://oarc.isc.org>

- NS statistics display
- Main member-only portal and incident-sharing system

<http://public.oarci.net>

- Public-facing drupal CMS

<http://lists.oarci.net/mailman/listinfo/>

# OARC Member Services

- DSC Data Gathering
  - From c, e, f-root and other live servers using DSC toolset
  - Graphing and display of statistics
  - Have participated with CAIDA in a number of “48-hour snapshots” of detailed root NS data (next soon)
- Analysis
  - Tools and server resources to allow members (and researchers) to conduct analysis
  - Policies and practices to ensure confidentiality and anonymity of data preserved

# OARC Member Services

- Member-only mailing list
- Encrypted jabber.oarc.isc.org server
  - including private groupchat
- <https://oarc.isc.org> portal
  - secure member-only “bulletin board”
  - filtered Channel from ISC and between members
  - member-determined bi- and multi-lateral controls on access to all of above
- Annual member meeting

# OARC Public Services

- Twice-yearly open meetings for DNS researchers and operators
- <dns-operations@lists.oarci.net> mailing list
- Two other closed DNS mailing lists
- <http://public.oarci.net>
  - Drupal-based content repository and forums
- “Project Orphanage”
  - **many** worthwhile projects to make the Internet a safer place are often in need of a home

# OARC Systems

- Main server resources are FreeBSD Celestica Opteron-based boxes located in ISC rack at PAIX
- in1 and in2.oarc.isc.org provide main world/member-facing services
  - websites, e-mail, jabber
- an1 and an2 for DSC data gathering and analysis
- fd1 and fd2 fiberchannel-attached dual storage servers for hosting data
- gs1 and gs2 guest access for other projects
- also console server, switch etc



# OARC Systems Development

- OARC systems are very much a work in progress
- in1 is running old FreeBSD variant, needs to be retired and upgraded
- requires remaining services to be migrated from in1 to in2
- development work has been done on fully redundant dual-hosted fiberchannel storage array, this needs to be put into production
- plenty of hardware resource for now

# OARC Upcoming Projects

- Malware repository (David Dagon)
- Passive DNS (April/Florian)
- AS112 operator website and mailing list
- Open Resolver data collection (Duane Wessels)
- Internet Operations Research  
Bibliography and Reviews site (John Kristoff)
- Data/tools catalogs (Brad Huffaker)



# OARC Contact Info

- Web: <https://oarc.isc.org>  
<http://public.oarci.net>
- E-mail: [keith\\_mitchell@isc.org](mailto:keith_mitchell@isc.org)
- Jabber: [keith@jabber.oarc.isc.org](jabber:keith@jabber.oarc.isc.org)
- Phone: +1 650 423 1348 (EST)

<http://public.oarci.net/oarc/workshop-2006/Mitchell-OARC-status.pdf>



**Questions ?**

