



X-Bone Overlays and Key VNRG Issues

Joe Touch, USC/ISI

Lars Eggert, Nokia

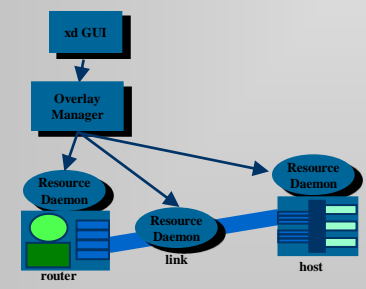
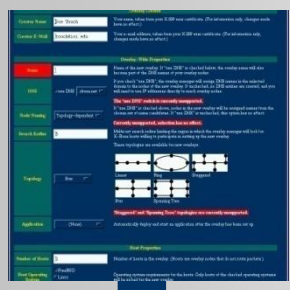
Yu-Shun Wang, Microsoft



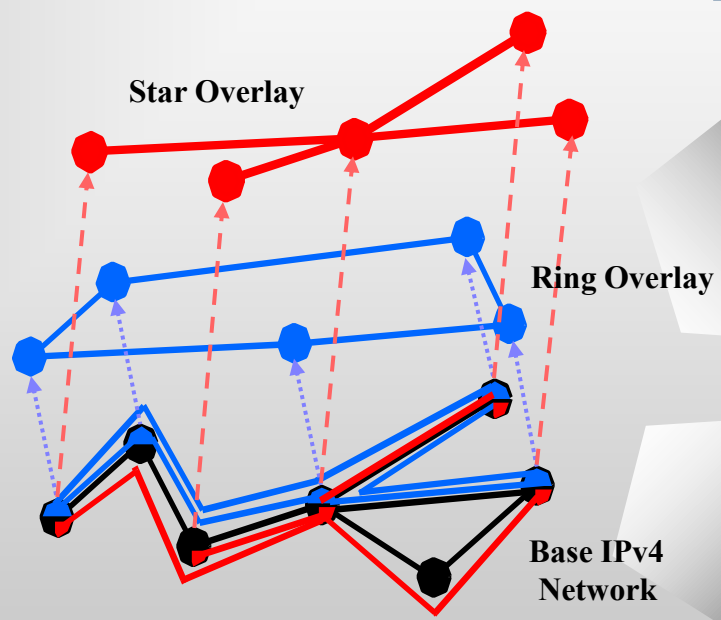


X-Bone System View

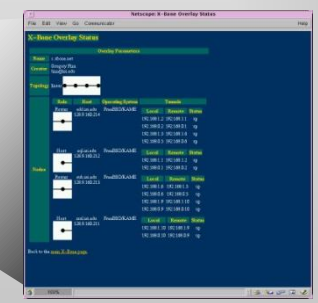
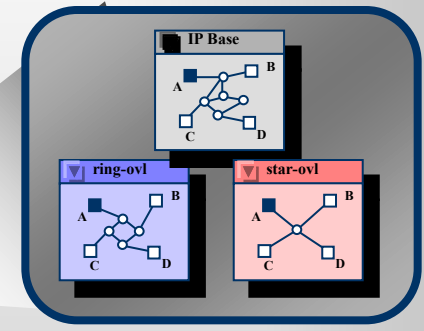
Web GUI



X-Bone system



Multiple views



Automated monitoring

X-Bone Overlay Creation

You are logged in with these credentials (taken from your X.509 certificate):

- Location** Marina del Rey, CA, US
- Organization** isi, div7
- User** Yu-Shun Wang <yushunwa@isi.edu>

This page allows you to create a new overlay. Please fill out **all remaining red fields**.

Overlay Creator

Creator Name Your name, taken from your X.509 user certificate. (For information only, changes made have no effect.)

Creator E-Mail Your e-mail address, taken from your X.509 user certificate. (For information only, changes made have no effect.)

Overlay-Wide Properties

Name Name of the new overlay. Suffix .xbone.net will be added automatically.

Search Radius Multicast search radius limiting the region in which the overlay manager will look for X-Bone hosts willing to participate in setting up the new overlay.

These topologies are available for new overlays:



Linear Ring Star

Topology Ring

Overlay Parameters

- Name** Ring1.xbone.net
- Search Radius** 30
- Topology** ring 
- Creator** Yu-Shun Wang
yushunwa@isi.edu
- Authentication** yushunwa@isi.edu (x509)

Overlay Nodes

Role	Status	Links	Host	Operating System
router	in	46	eql.isi.edu 128.9.160.212	FreeBSD/KAME
host	in	998	sin.isi.edu 128.9.160.197	FreeBSD/KAME
router	in	46	div.isi.edu 128.9.160.213	FreeBSD/KAME
host	in	48	sec.isi.edu 128.9.160.199	FreeBSD/KAME
router	in	44	cos.isi.edu 128.9.160.196	FreeBSD/KAME
host	in	1000	udelpc.cairn.net 140.173.1.46	FreeBSD/KAME
host	in	1000	bbnpc.cairn.net 140.173.1.49	FreeBSD/KAME
router	in	994	isiepc2.cairn.net 140.173.1.77	FreeBSD/KAME

Skipped Candidates

Role	Status	Links	Host	Operating System
router	out	46	add.isi.edu 128.9.160.214	FreeBSD/KAME
router	out	50	sub.isi.edu 128.9.160.215	FreeBSD/KAME
host	out	50	tan.isi.edu 128.9.160.198	FreeBSD/KAME
router	out	46	mul.isi.edu 128.9.160.211	FreeBSD/KAME



Monitoring the Ring

Status

Netscape: X-Bone Overlay Status

File Edit View Go Communicator Help

X-Bone Overlay Status

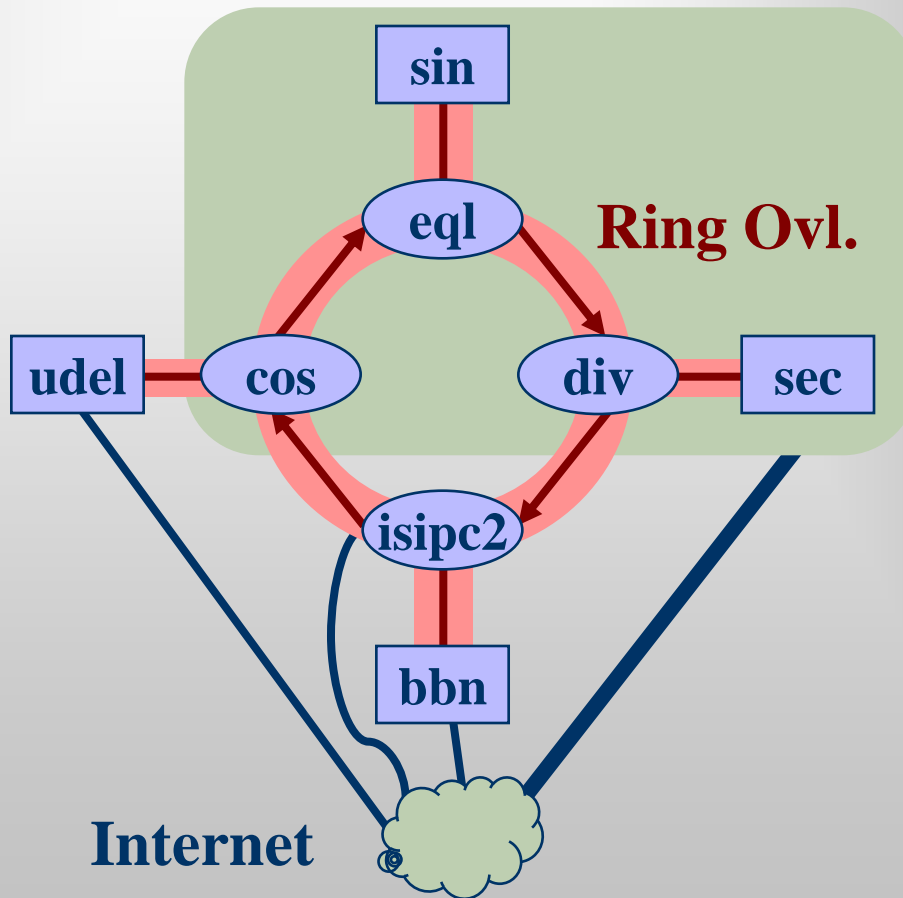
Overlay Parameters

Name: Ringl.thina.net
 Creator: Yu-Shua Wang
 yuhsuwa@isi.edu

Topology: ringl

Role	Host	Operating System	Local	Remote	Status
Router	eql.isi.edu 138.9.140.212	FreeBSD/3.0/AMI	198.32.7.38	198.32.7.57	up
Host	main.isi.edu 138.9.140.197	FreeBSD/3.0/AMI	198.32.6.38	198.32.6.37	up
Router	4r.isi.edu 138.9.140.213	FreeBSD/3.0/AMI	198.32.7.41	198.32.7.42	up
Host	rs.isi.edu 138.9.140.199	FreeBSD/3.0/AMI	198.32.6.41	198.32.6.42	up
Router	4r.isi.edu 138.9.140.213	FreeBSD/3.0/AMI	198.32.7.45	198.32.7.46	up
Host	rs.isi.edu 138.9.140.199	FreeBSD/3.0/AMI	198.32.6.45	198.32.6.46	up
Router	4r.isi.edu 138.9.140.213	FreeBSD/3.0/AMI	198.32.7.61	198.32.7.62	up
Host	rs.isi.edu 138.9.140.199	FreeBSD/3.0/AMI	198.32.6.61	198.32.6.62	up
Router	isipc2.csm.net 142.173.1.77	FreeBSD/3.0/AMI	198.32.6.02	198.32.6.01	up
Host	vdalpo.csm.net 142.173.1.46	FreeBSD/3.0/AMI	198.32.7.54	198.32.7.53	up
Host	khqpc.csm.net 142.173.1.49	FreeBSD/3.0/AMI	198.32.6.54	198.32.6.53	up
Router	isipc2.csm.net 142.173.1.77	FreeBSD/3.0/AMI	198.32.7.50	198.32.7.49	up
Host	vdalpo.csm.net 142.173.1.46	FreeBSD/3.0/AMI	198.32.6.50	198.32.6.49	up
Router	isipc2.csm.net 142.173.1.77	FreeBSD/3.0/AMI	198.32.7.33	198.32.7.34	up
Host	vdalpo.csm.net 142.173.1.46	FreeBSD/3.0/AMI	198.32.6.33	198.32.6.34	up
Host	khqpc.csm.net 142.173.1.49	FreeBSD/3.0/AMI	198.32.7.46	198.32.7.45	up
Host	rs.isi.edu 138.9.140.199	FreeBSD/3.0/AMI	198.32.6.46	198.32.6.45	up
Host	main.isi.edu 138.9.140.197	FreeBSD/3.0/AMI	198.32.7.49	198.32.7.50	up
Host	rs.isi.edu 138.9.140.199	FreeBSD/3.0/AMI	198.32.6.49	198.32.6.50	up

Back to the main X-Bone page.





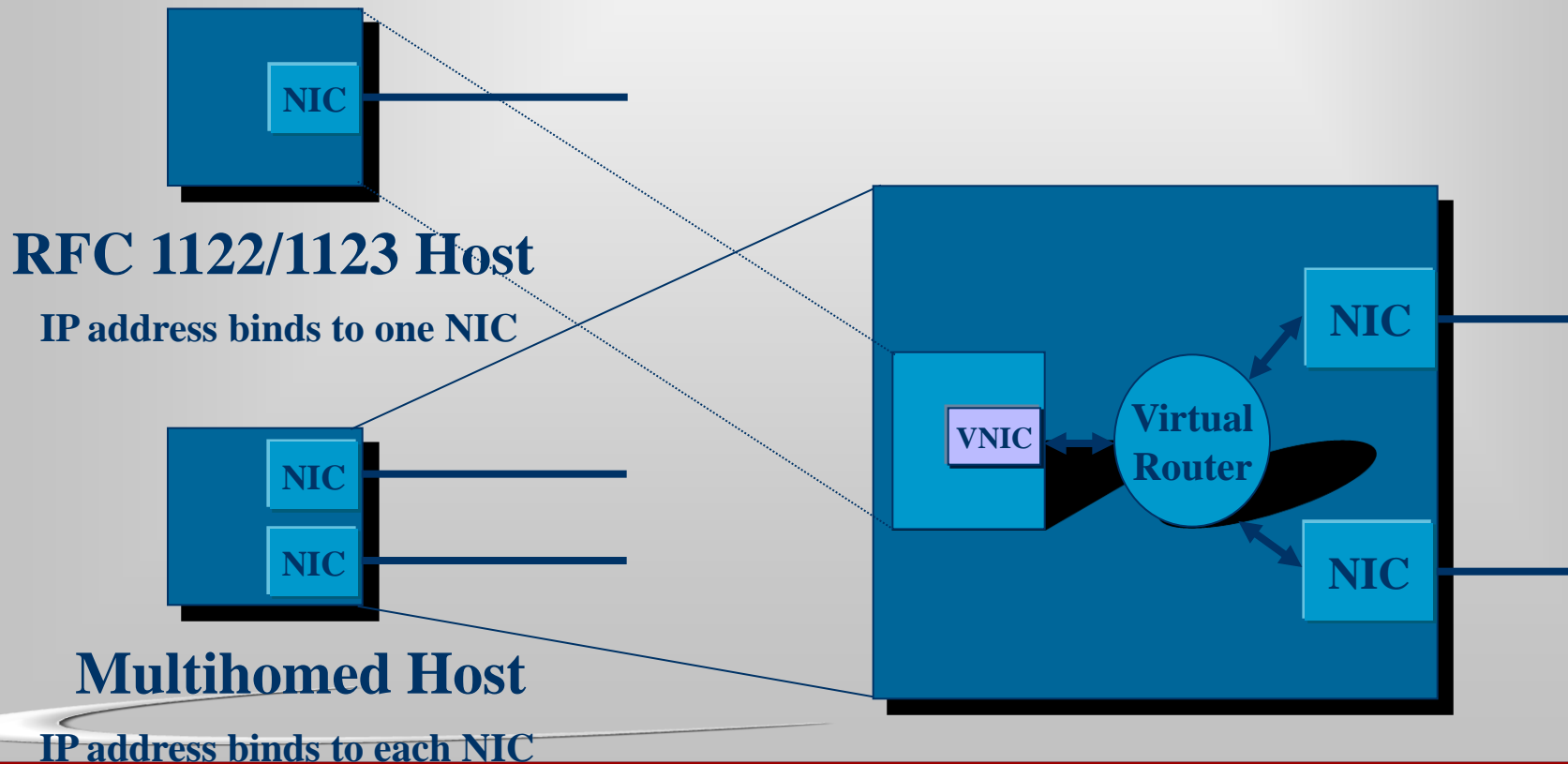
Net vs. Host Virt.

- Network components:
 - Virt. Host → hidden router
 - Virt. Link → 2 layers (strong link, weak net),
separate link from routing (RFC 3884)
 - Virt. Router → partitioned forwarding
(clonable stacks, now in FreeBSD)
- Capabilities:
 - Revisitation → multihoming
 - Recursion → router as network, "BARP" (LISP-like)



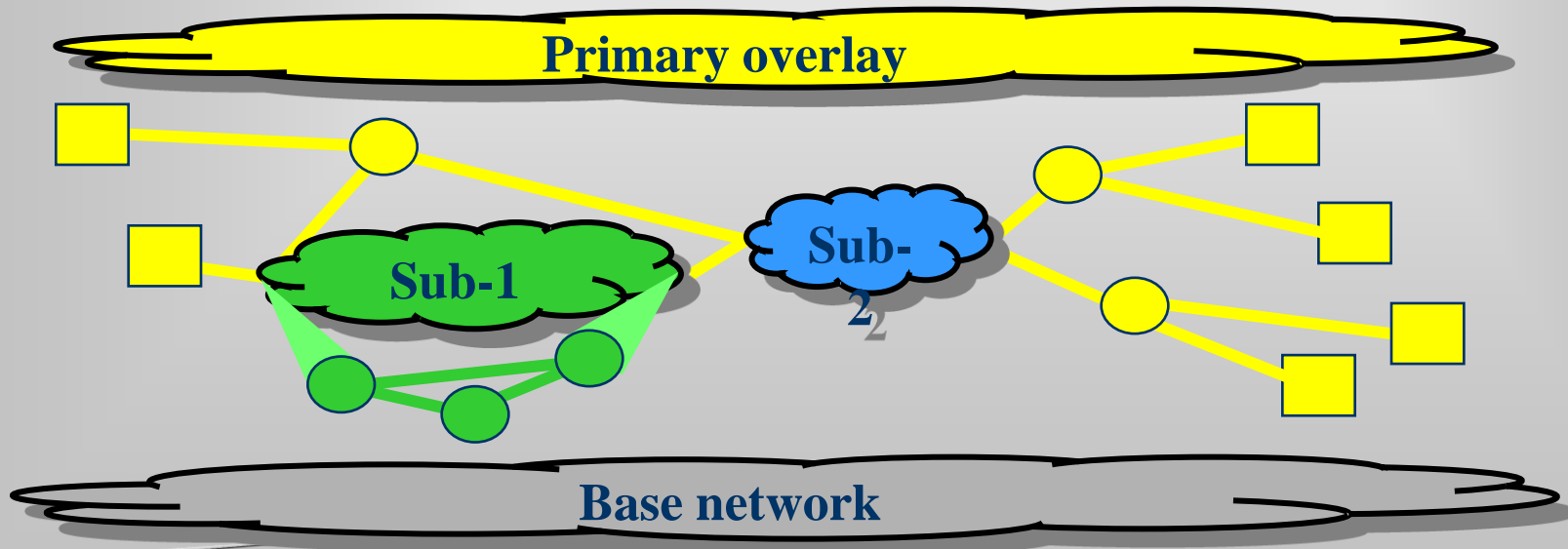
Hidden host router

- Apps can't select source IP, no IP w/o NIC



Recursion-as-Router

- **Sub-overlays look like routers**
 - L3 version of *rbridges* (*IETF TRILL WG*)
 - *Similar to LISP*





Questions

- Level of virtualization?
 - Per virtual interface
- Can single process be in multiple VNs?
 - Yes; verified over 800 (DynaBone striping)
 - “proactive/reactive mux” as multiVN router
- Host multiple times in a VN (recurrence)?
 - Yes (via double encapsulation)



More Questions

- How do we indicate VN?
 - Per-process default DNS suffixes, the suffix indicated the VN
 - The suffix translated to an IP address range
 - Similar to use of VN ID shim
- Anything else?
 - Also supported recursion (VNs in VNs)