

OCALE

Overlay Convergence Architecture for
supporting Legacy Applications on Overlays

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Motivation

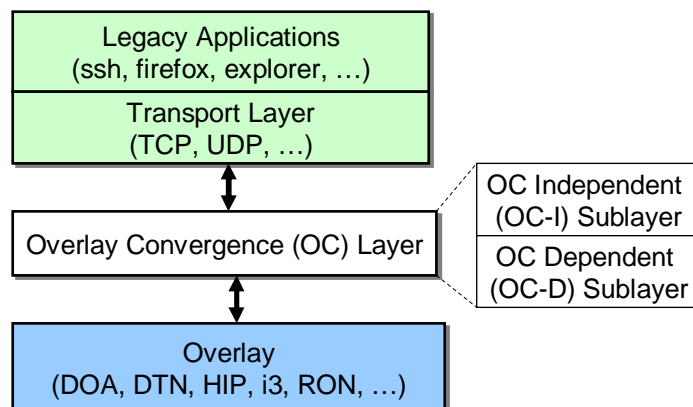
- Many attempts to improve the Internet:
 - i3 : mobility, NAT traversal, anycast, multicast
 - DOA: middlebox support
 - OverQoS: quality of service
 - SIFF: resilience against DDoS attacks
- But still no widespread deployment...
- Problem: rewriting/porting popular applications for new architectures a daunting task!

Goal

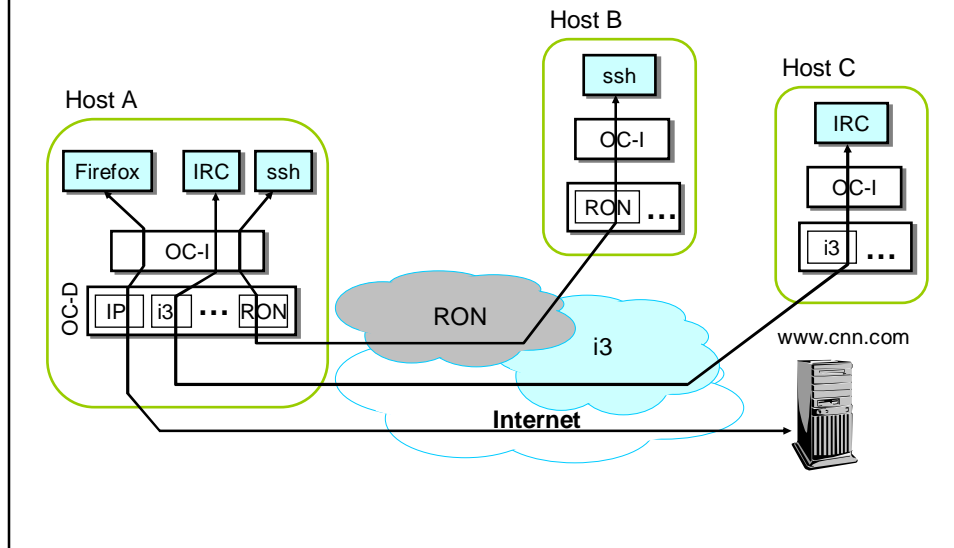
- Support legacy applications (e.g. ssh, Firefox, IE) over new network architectures and overlays
 - Enable users to take advantage of new network functionality using their favorite applications!

Solution: Overlay Convergence Architecture for Legacy Applications (OCALA)

Interpose an Overlay Convergence Layer between transport layer and overlay networks



Simultaneous access to multiple overlays

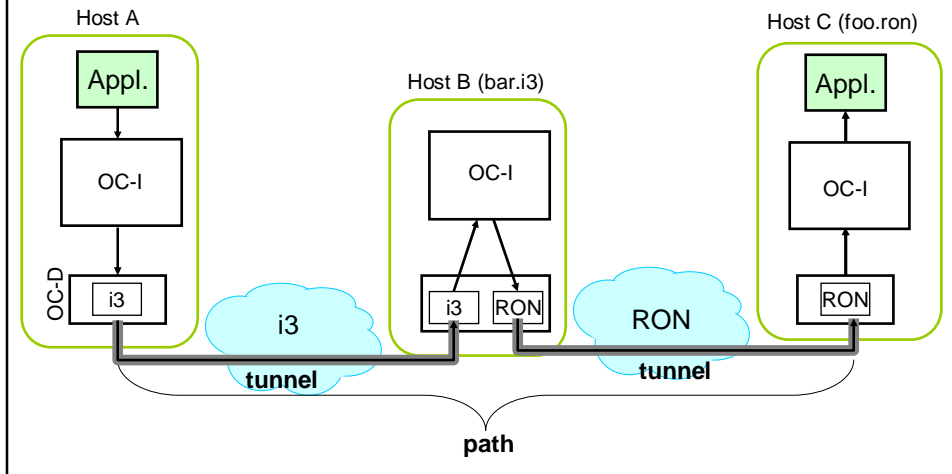


Which overlay to use?

- IP address and port number :
 - Eg: Forward all packets sent to 128.32.132.223 port 22 over RON
- DNS name:
 - Eg: Forward all packets sent to *berkeley.edu.ron* over RON
 - Eg: Forward all packets sent to *berkeley.edu.i3* over *i3*

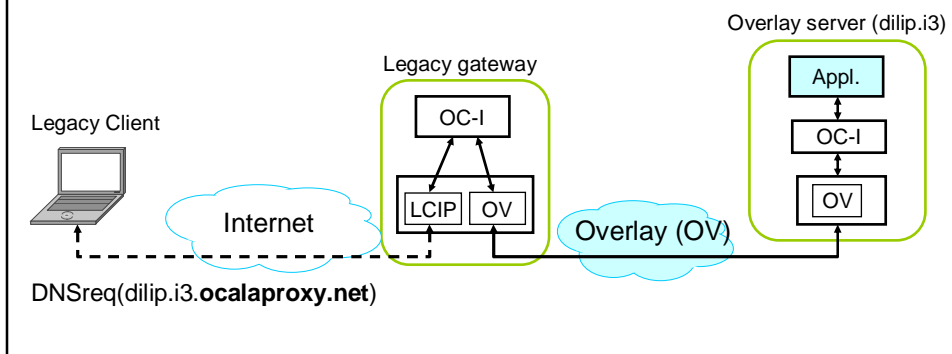
Bridging Multiple Architectures

- Communication across overlays
- Stitch together functionality



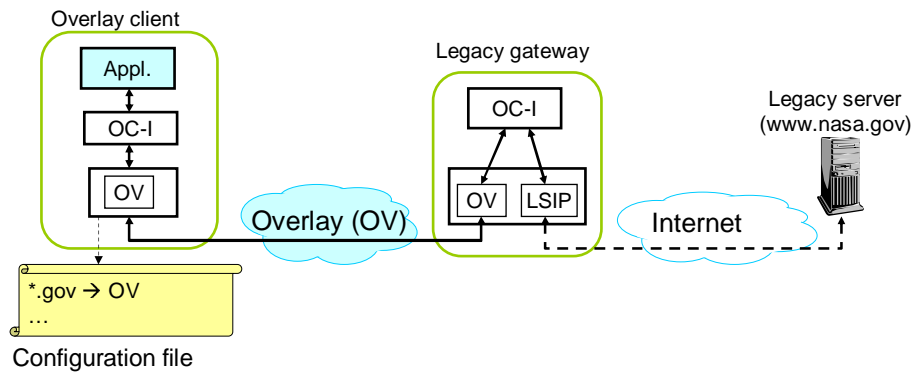
Legacy Client Gateways – Demo

- Clients need not run OCALA locally
- Gateway has special Legacy Client IP (LCIP) module



Legacy Server Gateways

- Server need not run OCALA locally
- Special OC-D module called Legacy Server IP (LSIP) at gateway
- LSIP behaves like a software NAT box

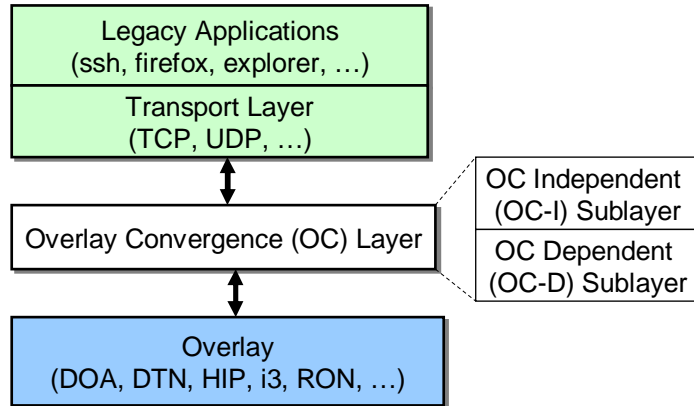


Legacy Client Gateways – Demo

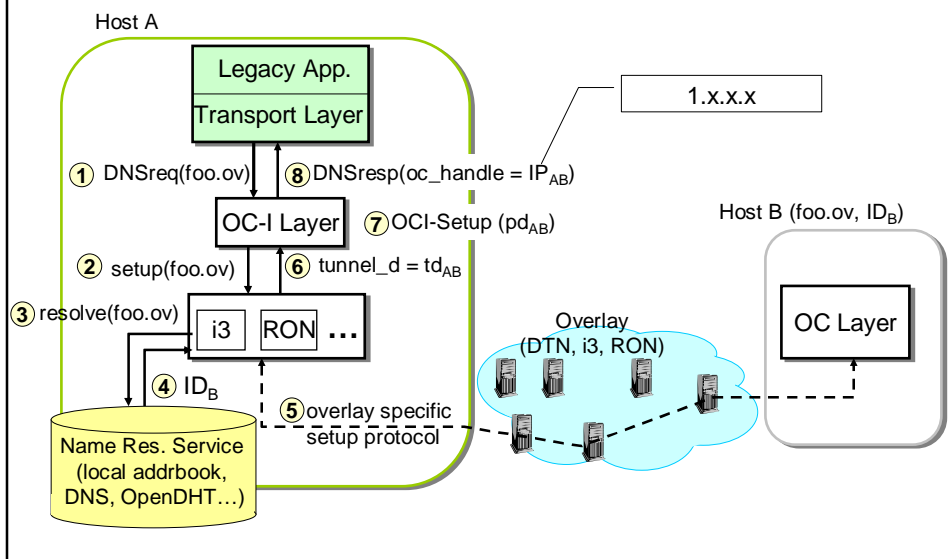
- Can access following links:
 - <http://ionhome.pli3.ocalaproxy.net:8040/ifconfig.html>
 - <http://rodrigo.pli3.ocalaproxy.net:8040/gallery/albums.php>
 - http://dilip.pli3.ocalaproxy.net:8040/april/april8_10_Vodafone_UIUC/index.html

Overlay Convergence Architecture for Legacy Applications (OCALA)

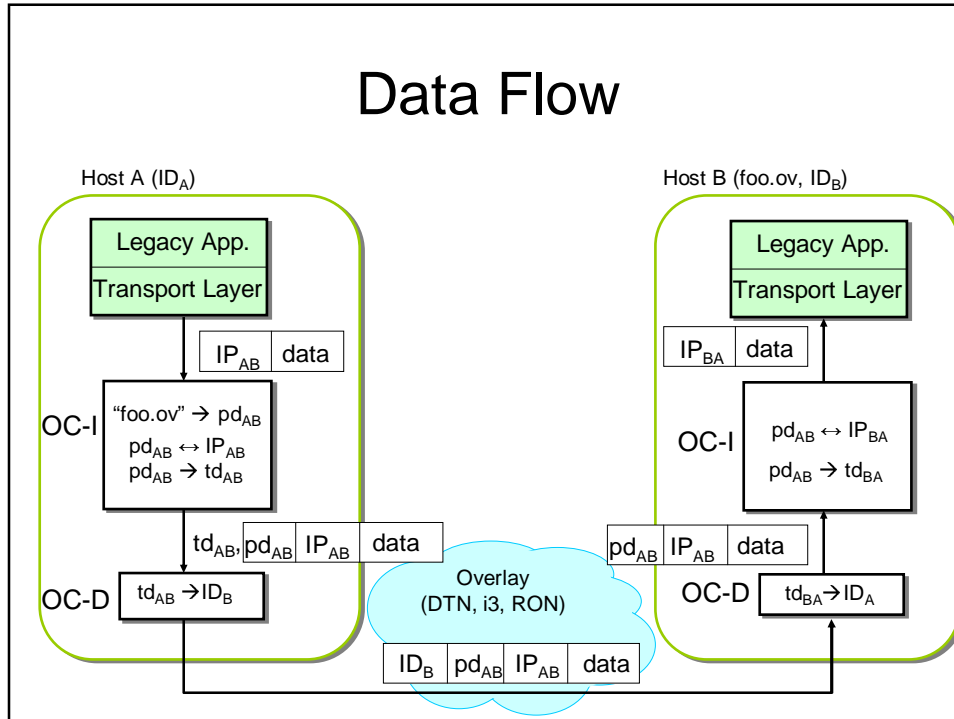
Interpose an Overlay Convergence Layer between transport layer and overlay networks



Setting up a new connection



Data Flow



Implementation

- Implemented as a proxy to be run by the user.
 - *tun* device used to capture packets
- Works on Linux and Windows XP/2000
 - Mac almost done...
- OC-D modules
 - Dynamically loadable libraries.
 - Implemented RON, i3, DOA, HIP OC-D modules.
 - 250 lines of glue code in case of RON.
 - HIP/DOA OC-D modules implemented by HIP/DOA researchers
- Configuration GUI

Common functionality

- Functionality required by multiple overlays implemented in the OC-I layer
- Example: Security
 - Similar to SSL
 - Modifications for supporting middleboxes

Conclusion

- Enables unmodified legacy applications to simultaneously access multiple overlays
- Stitch together functionality of different overlays
- Helps network researchers bring functionality of new network architectures to real users