

# OCALA

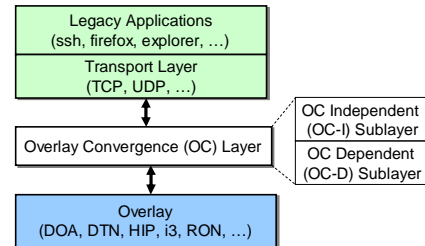
Overlay Convergence Architecture for supporting Legacy Applications on Overlays

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## Solution: Overlay Convergence Architecture for Legacy Applications (OCALA)

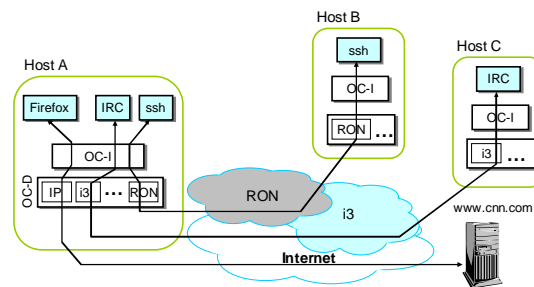
Interpose an Overlay Convergence Layer between transport layer and overlay networks



## 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!

## Simultaneous access to multiple overlays



## Goal

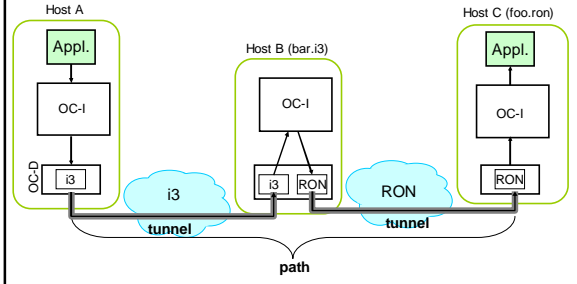
- Support legacy applications (e.g. ssh, Firefox, IE) over new network architectures and overlays
  - Enable users to take advantage of new network functionality using their favorite applications!

## 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

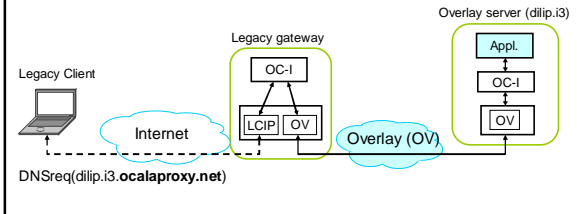


## Legacy Client Gateways – Demo

- 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](http://dilip.pli3.ocalaproxy.net:8040/april/april8_10_Vodafone_UIUC/index.html)

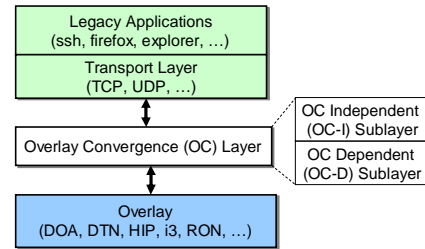
## Legacy Client Gateways – Demo

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



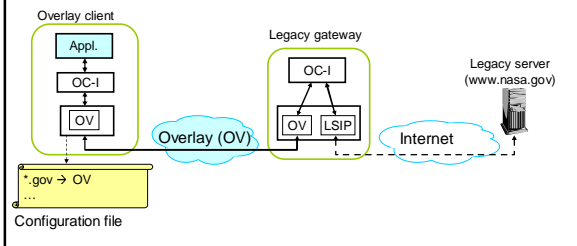
## Overlay Convergence Architecture for Legacy Applications (OCALA)

Interpose an Overlay Convergence Layer between transport layer and overlay networks

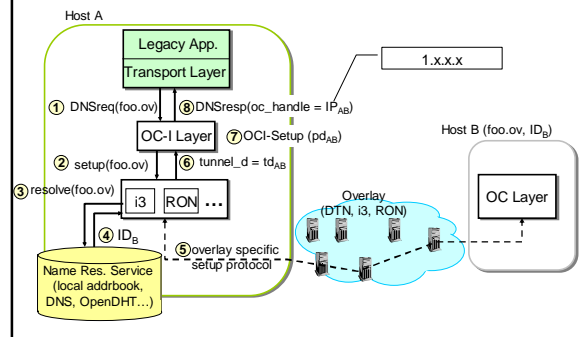


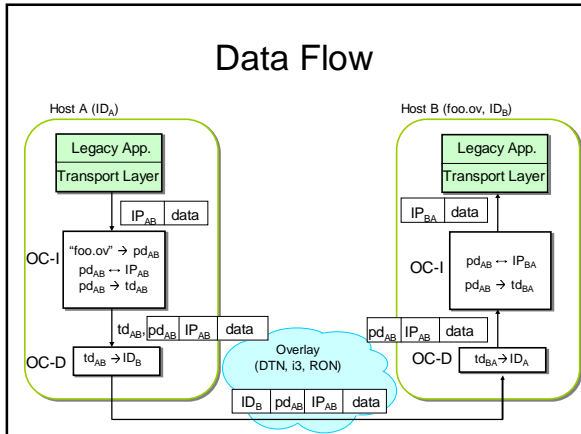
## Legacy Server Gateways

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



## Setting up a new connection





- ### 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

- ### 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