



# Indiana University Openflow Campus Trials





# IU Openflow campus trials

## Operations

- How does Openflow fit into campus operations and procedures?

## Distributed measurement

- Capturing data

## Inter-campus connectivity

- Dynamic provisioned circuits

- Sherpa, ION/DCN, etc



# Operations

- 🔧 Procedures for Operations
- 🔧 Software Tools
  - 🔧 How to integrate with campus, GENI
  - 🔧 Co-located research equipment

## 🔧 Visualizations

## 🔧 Best Practices Document



**GlobalNOC AlertMon**

Current Alerts  
Last Updated 19:10:18

Unacknowledged Alerts  
There are no active unacknowledged alerts.

Acknowledged Alerts

+	2009-11-16 12:19:42	NLR WaveNet: UCSB1CA530 Multiple Database Devices GFP-CSF and SYNCLOSS [9802:52]	1 total alert	(remove all)
+	2009-11-11 20:39:06	NLR WaveNet: [MINOR] CSLO1CA530 PWR-1-B and PWR-2-B BAT-FAIL: Battery... [9772:52]	2 total alerts	(remove all)
+	2009-11-13 22:30:42	NLR FrameNet: NLR Layer 2 Link to NLRview SRP2 is Down [5819:55]	1 total alert	(remove all)
+	2009-11-13 05:05:42	Internet2 CPS: Internet2 CPS Peer CBS via PAIX (NEWY) Outage [1192:86]	1 total alert	(remove all)
+	2009-11-12 21:00:46	Internet2 IP: Internet2 IP Network Peer DREN (WASH) Outage [15005:45]	1 total alert	(remove all)
+	2009-11-11 20:35:38	NLR WaveNet: MCLNVA39A SLOT-3-3 EQPT: Equipment Failure [9771:52]	1 total alert	(remove all)
+	2009-11-11 20:59:03	NLR WaveNet: NLR-DALL-RALE-10GE-03594 - KSCZMO30A TXP Re-install [9774:52]	1 total alert	(remove all)
+	2009-10-09 13:57:32	NLR FrameNet: NLR Layer 2 Link to vini2 Instability [5784:55]	1 total alert	(remove all)
+	2009-07-15 17:24:54	Internet2 Infinera: AlertMON Monitoring of Metro Infinera Nodes [430:100]	2 total alerts	(remove all)
+	2009-10-27 13:57:38	System Support: ndb4.abilene.ucid.edu - CRITICAL - owamp Alarm [4885:101]	1 total alert	(remove all)
+	2009-11-05 07:47:45	IP Grid: IP Grid Layer 2 sw5.blde.iu.teragrid.org No response from 14... [433:75]	1 total alert	(remove all)
+	2009-11-03 09:58:39	Internet2 CPS: Internet2 CPS Peer Data Fortress (SEAT) Outage [1175:86]	1 total alert	(remove all)
+	2009-06-22 20:35:54	NLR WaveNet: Starlight/Route 39 (CHIC-WASH) route merger [8560:52]	2 total alerts	(remove all)

**Networks**

<input checked="" type="checkbox"/> AMPATH	<input checked="" type="checkbox"/> CIC OmniPoP	<input checked="" type="checkbox"/> Connecticut Education
<input checked="" type="checkbox"/> GRNOC Internal	<input checked="" type="checkbox"/> I-Light	<input checked="" type="checkbox"/> IP Grid
<input checked="" type="checkbox"/> IU CNI	<input checked="" type="checkbox"/> Indiana GigaPOP	<input checked="" type="checkbox"/> Indiana University
<input checked="" type="checkbox"/> Internet2 Network	<input checked="" type="checkbox"/> MAN LAN	<input checked="" type="checkbox"/> MAX GigaPOP
<input checked="" type="checkbox"/> National LambdaRail	<input checked="" type="checkbox"/> Open Science Grid	<input checked="" type="checkbox"/> TransPAC
<input checked="" type="checkbox"/> other		



# Operations and Experiments

## Testnet

- Test to failure

  - Broadcast storms

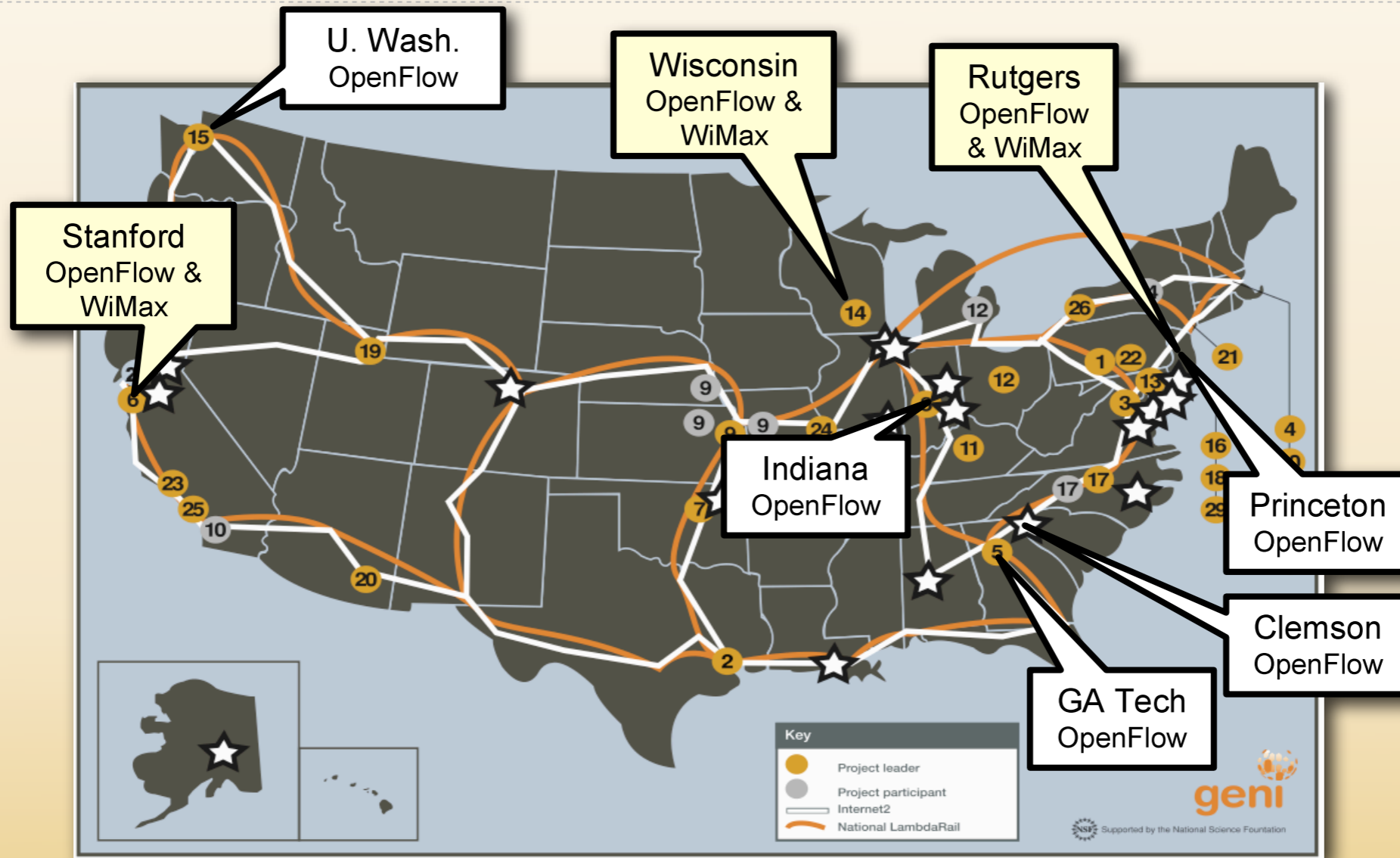
## Production deployment

- Integration (inter-campus, regional, national backbone)


- Researchers - IPTV, Flow Based Monitoring, Security Datasets



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# GlobalNOC

 <http://globalnoc.iu.edu>