

Welcome to

# MAX ALL HANDS MEETING

Abdella Battou  
Interim Executive Director

Nov 9<sup>th</sup>, 2011

Mid-Atlantic Crossroads

# Agenda

- 8:15am to 9:00am – Continental Breakfast
- 9:00am to 9:15am – A word from the CIOs
- 9:15am to 10:00am MAX Updates
  - Admin, Production, and Research
- 10:00am to 11:00am High Performance Optical Network Research and Applications at Northrop Grumman Information System by Paul Conoval Chief Technologist & Director, Technology Investments Northrop Grumman Information Systems
- **11:00am to 12:00am Open Discussion**
  - MDTrust/VATrust, Direct Connect Amazon, OpenFlow, ION service, 100G service
- 12:00pm to 1pm : Lunch
- 1:00pm to 2:00pm NJVid : Federated Digital Video Repository & Streaming by George Laskaris, Chief Executive Officer, NJEdge
- **2:00pm to 3:00pm Open Discussion**
  - Digital Video Repository, I2 NET+ services

# Open Discussions

- Project oriented
- Discussions outcome
  - ▣ A task group composed of leaders from organizations interested to pilot the project
  - ▣ A clear set of action items

# A word from the CIOs

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- Brian Voss, UMCP
- Dan Cautis, GT
- Dave Steinour, GW

# Admin

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- Workshops
- Website
- Move to M-Square
- Financials

# MAX Updates - Admin

- Workshops

MAX Teen Tech Camp – July

High Performance Computing Boot Camp – August

IPv6 Workshop – August

Suggestions for future workshops?

E-mail: [thurd@maxgigapop.net](mailto:thurd@maxgigapop.net)

# MAX Updates - Admin

□ MAX Website

[www.maxgigapop.net](http://www.maxgigapop.net)

Interested in being highlighted as a MAX member of the month?

E-mail: [thurd@maxgigapop.net](mailto:thurd@maxgigapop.net)

# MAX Updates - Admin

- Move to M-Square
  - ▣ Lease negotiations
  - ▣ Pricing for space
  - ▣ Obtaining own insurance
  - ▣ Early Spring move date



# MAX Updates - Admin

- All university participants paid up (Part & Port fees)
- FY11 contract negotiations for 4 Federal Agencies.
- Awaiting FY12 POs for federal agencies.
- Financial plans for next 8-months of fiscal year
  - ▣ Lab and office space build out
  - ▣ Moving cost
  - ▣ Baltimore Pop – Fujitsu equipment
  - ▣ Elastic Optics Research Project

# Production

- BALT PoP
- SHADY GROVE PoP
- MCLean WIX
- Transfer Box Service
- Dynes
- MARC – Mid Atlantic Research Cloud
- SC11

# BALT PoP Project

- ❑ Baltimore is normalizing to our standard build
- ❑ DWDM ring between College Park, 300 West Lexington, and 6 St Paul
- ❑ We can deliver L1-L3 services at both locations
- ❑ We will migrate services picked up at 660 Redwood over to 300WL
- ❑ Expecting equipment delivery and install by end of year
- ❑ Expecting redundant fiber down to College Park by end of Q1 next year

# SHADY GROVE PoP Project

- 2 sites in considerations
  - ▣ JHU and UMD
- Discussions with JHU for space underway
- Strong Interest from several organizations
  - ▣ JHU, UMD, NCI, Open Health Systems Laboratory
- Next step is building the fiber loop
- Time-line : Mid 2012

# MAX Transfer BOX Service

## Today

- ❑ 5 TB
- ❑ SAML Authentication
- ❑ Stand-alone server

## Next

- ❑ 60 TB
- ❑ Federated Shibboleth Authentication
- ❑ Cloud

# Direct Connect Amazon

- 10G pipe between MAX and Amazon AWS at Equinix
- MAX will pick up the recurring costs for the physical pipe
- Traffic to AWS travels over individual VLANs from a MAX member port out to AWS
- Traffic in a vlan is billed directly by AMZ to the member
- AMZ costs: \$0.02/GB outbound (versus "over the internet" costs of \$0.12/GB)

# DYNES Project

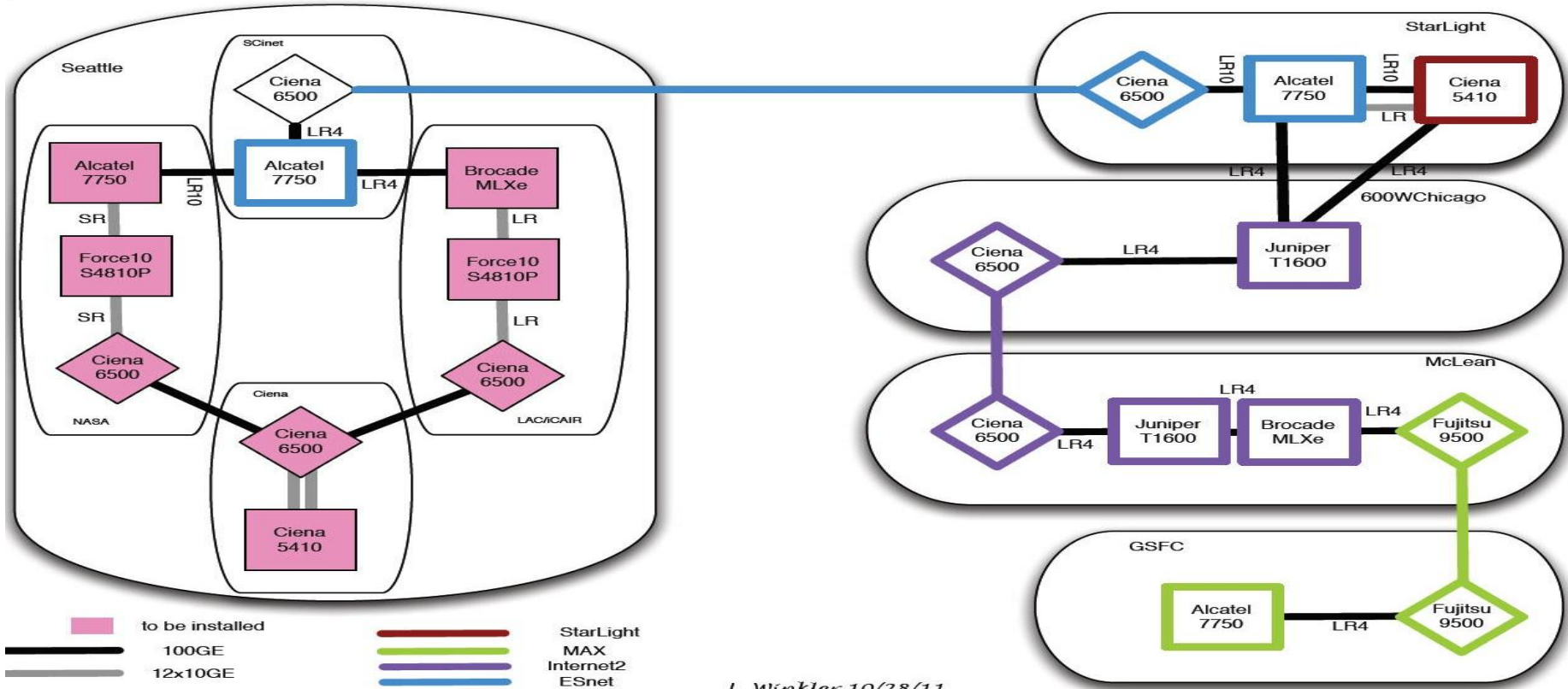
- Nationwide "cyber instrument" - initial focus is LHC data acquisition and analysis
- Rides on I2 ION services - dynamic circuit creation for large bandwidth/short duration flows
- ISI is testing configurations and software in MAX lab, expected deployment early next year
- JHU is anchor tenant due to their AstroPhysics work

# MAX Research Community Cloud

- 80 Processing Cores, 60 TB Storage
- Eucalyptus based
- Next blade Chassis supporting 160+ Cores
- 3 TB disks should allow 90 TB increases



# SC 2011



# RESEARCH

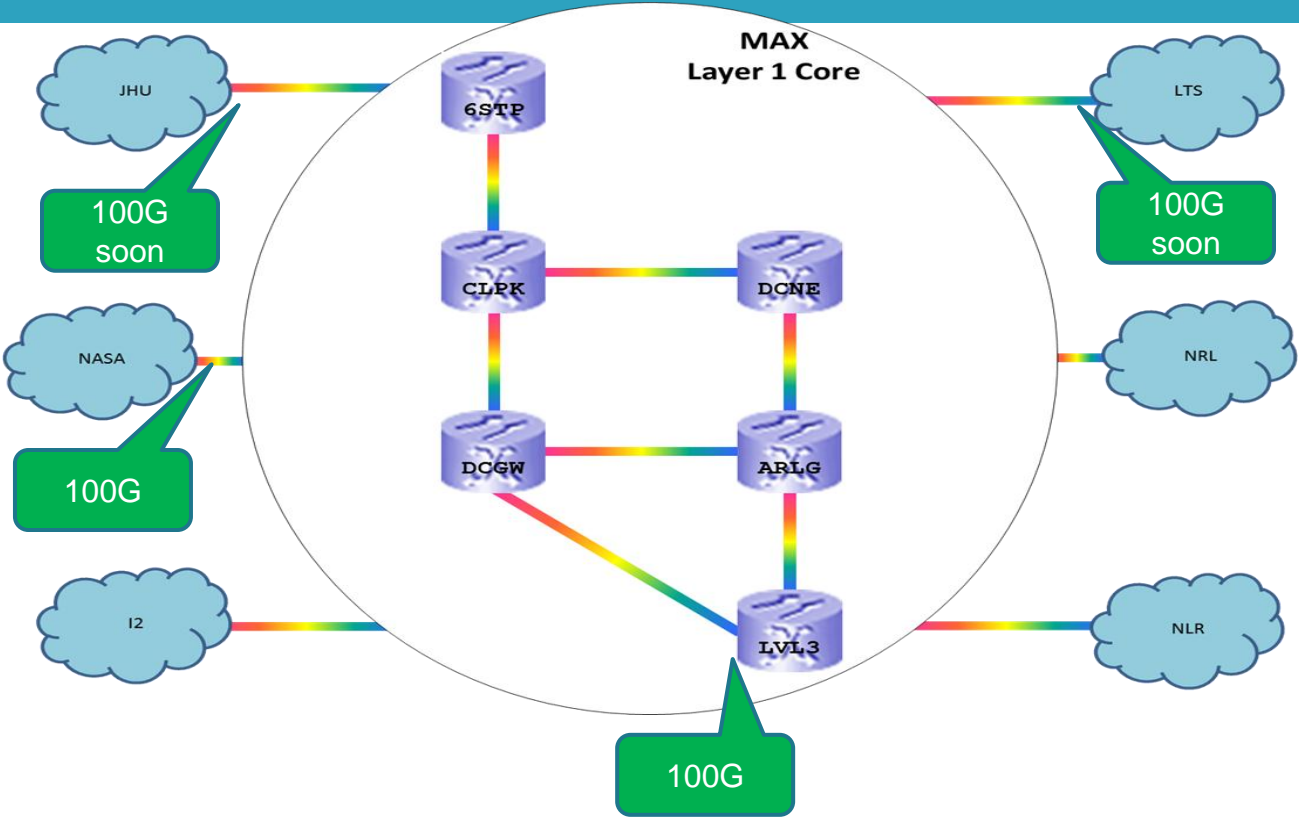


- 100G Research
- Software Defined Networks (SDN) - OpenFlow
- GENI

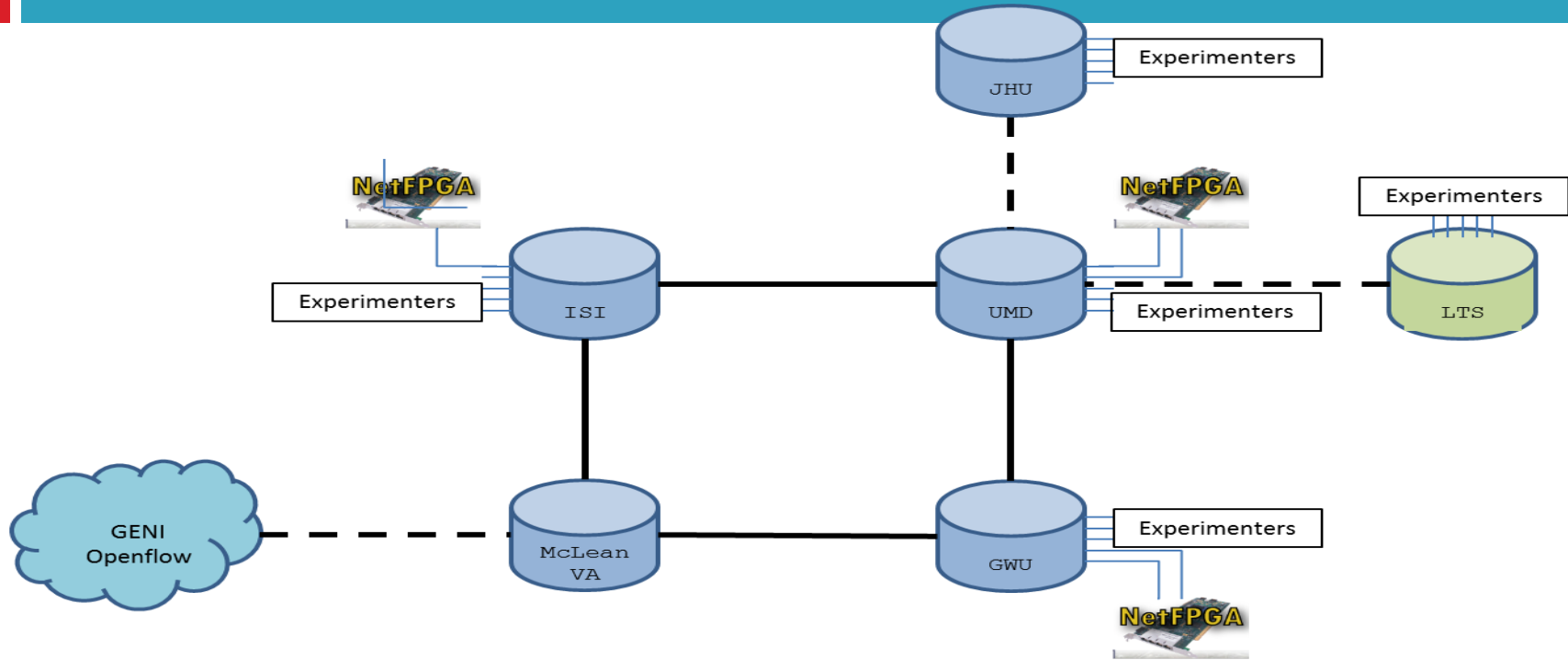
# Research Network – 100G

- ❑ Operational network core consisting of Fujitsu Flashwave 9500.
- ❑ True all-optical ROADM (Reconfigurable Optical Add-Drop Multiplexer) switched infrastructure
- ❑ Deployed as six node DWDM mesh network around MD, DC and VA.
- ❑ Supports 100 Gb/s per lambda transport (Ethernet, OTU4 client access)
- ❑ 44 lambdas per physical fiber capability, resulting in 4.4 Tb/s per fiber
- ❑ Transponders with tunable wavelength capabilities
- ❑ Ability to accept true all-optical hand-off from clients or other networks.
- ❑ Up to 100 Gb/s Multi-Technology (Ethernet, OTN) client access ports

# Research Network – DWDM Core



# Research Network – OpenFlow Testbed



# Research Network – Connectivity

- Multiple 10G connectivity to I2 and NLR
- Plans to have 100G connectivity to I2 in the near future and NLR once they deploy 100G
- 10G connectivity with GENI Openflow deployment and an 1G to ProtoGENI
- 100G connectivity with ESnet, NASA, LTS and JHU in the near future.

# Research Network – Initiatives

- Focus in core areas around Dynamic Optical Networks including
  - Management and Control Plane Architectures
  - Optical Performance
  - Network Virtualization
  - Next-generation Terabit Interfaces
- Global Environment For Network Innovations (GENI) program
  - Layer 1: All-optical switching/transport core
  - Layer 2: Ethernet/OpenFlow switches providing dedicated end-to-end Gigabit and 10 Gigabit Ethernet circuits
  - Programmable network hardware: NetFPGA card installed in rack mount PC
  - Virtualization servers: PlanetLab MyPLC, Eucalyptus cloud
- Collaborative Research on Optical Layer Virtualization and 4D Control Plane with GWU and UVA
- 100G Connectivity to the JHU NSF-Funded Data Scope Management

# Joint 100G Research – Any Interest

- Make the new 100G research network accessible to researchers at our top member institutions and federal labs
- Several participants are now asking for 100G capability and 2 have already or about to place orders for it
  - ▣ JHU and LTS



# Presentation by NGC



## High Performance Optical Network Research and Applications at Northrop Grumman Information System by Paul Conoval

Chief Technologist & Director, Technology  
Investments Northrop Grumman Information  
Systems

# Open Discussion – State-wide services

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- Identity Management
- Cloud services – Direct connect to Amazon
- OpenFlow
- NET+ Internet2 Services

# Presentation by NJEDGE



NJVid : Federated Digital Video  
Repository & Streaming  
by George Laskaris,  
Chief Executive Officer, NJEdge

# Open Discussion - State-wide services

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- Digital Video Repository
- GENI Racks – campus interest

Thank You