GENI Experiments for Networking Research and Education

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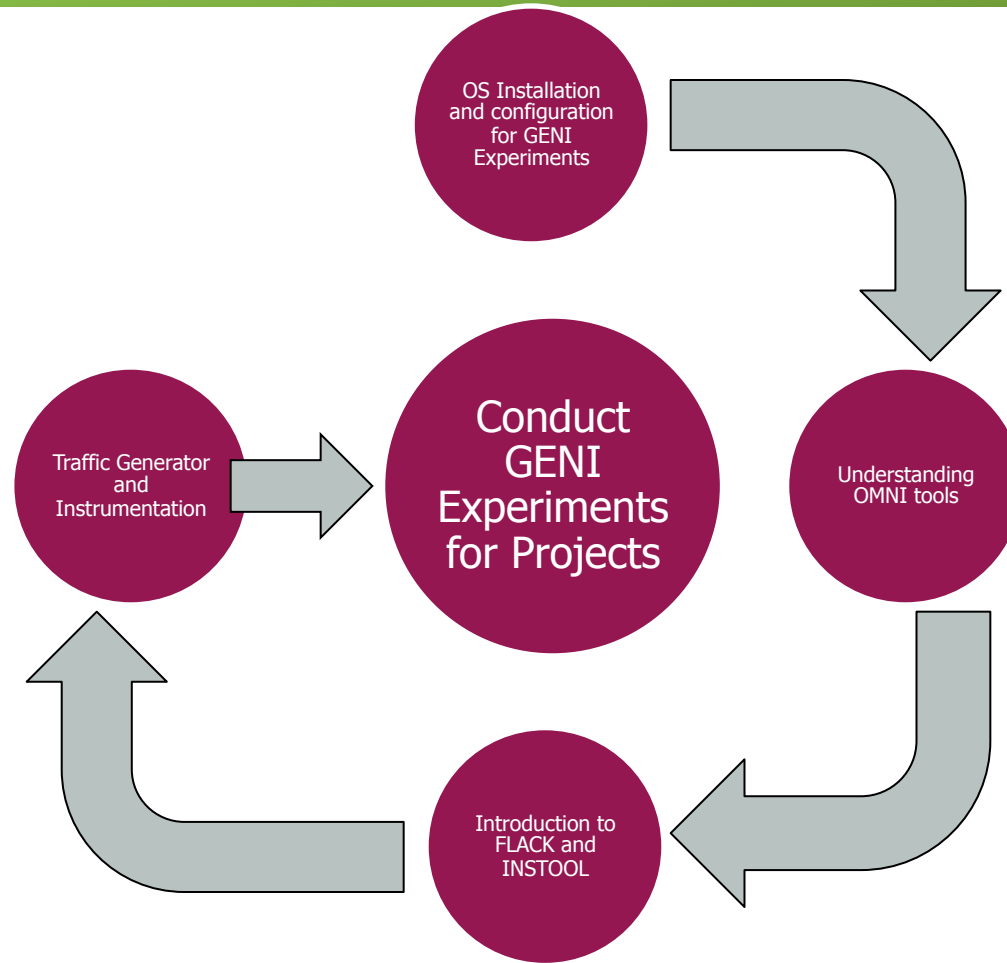# Course Description

4055-850: Network Design and Performance

➢ The (graduate level) course will examine the design and performance of networks

➢ Students will learn to design networks based on identified needs and analyze the performance of the networks

➢ The designs include site, campus, and enterprise

➢ WAN technologies will be combined with LAN technologies in the design of enterprise networks

➢ Students will learn to assess the business goals and apply them to achieve network goals

➢ Students will also learn to evaluate the security goals of a network and to integrate these goals in the design

The Goal, Objective, and Approach of GENI Experiments

➤ Goal: Conduct real-world, at-scale, and repeatable experiments on GENI for networking research and education

➤ Objective: Explore a project-based approach to understanding multiple GENI resources

➤ Approach: Use a series of lab exercises to build a solid foundation for GENI projects

The Proposed Approach

Labs and Projects

OS Installation and configuration for GENI Experiments

Understanding OMNI tools

Introduction to FLACK and INSTOOL

Traffic Generator and Instrumentation

Conduct GENI Experiments for Projects

GENI Experiments

Summary

Lab 1 : OS installation and configuration for GENI experiments

Lab 2 : ProtoGENI resource reservation using OMNI tools

Lab 3 : Introduction to Flack and INSTOOLS

Lab 4 : Familiarity of IPERF and Wireshark for GENI experiments in the course project

Methodology: Project-based approach

Feedback

Support and Technical Perspectives

- Support
  - GENI wiki is very useful for installation and configuration. But, when some issue is encountered, it is difficult to find solutions from online supporting materials
  - Good news: all GPO staff, Stanford OpenFlow developers, and the ProtoGENI team are very supportive (very fast responses and patience to answer all questions). Many thanks!
- Technical
  - Flack is simple and very easy to use, But, while OMNI is very stable, it appears that Flack is limited and experiences issues in resource reservation sometimes
  - In INSTOOLS, a user cannot have simultaneous VNC connections with nodes at the same site

Feedback

Cont.

- Technical
    - It will be useful if we can facilitate a single node with multiple users access on OMNI
    - GENI Aggregate Manager API accepts ProtoGENI account to reserve PlanetLab resources. But, their login IDs are not consistent. For example,
        - pgeni_aakella →PlanetLab aakella →ProtoGENI
    - The option to boot a node with a GUI will be helpful for beginners
    - Rspec has an OpenFlow switch's DPID
        - Can DPID be replaced by hostname since DPID may change?

GENI Experiments

Thank you

Questions, Suggestions, and Comments?

GENI Experiments

Thank you

Contact information

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