ILLINOIS INSTITUTE OF TECHNOLOGY

NG911 – Elements Team

Support, Integration, Development

Terence Fernandes
tfernand@iit.edu

Phong Pham
ppham2@iit.edu

April 27th, 2011

A little bit about ourselves…

- We started working on this project last semester and helped graduate students *Vikas V. and Sravanti M.* with the task of integrating the entire architecture at IIT.
- We are now responsible for the architecture, in terms of:

Technical support

Integration of new components

Development of solutions

Project Goals

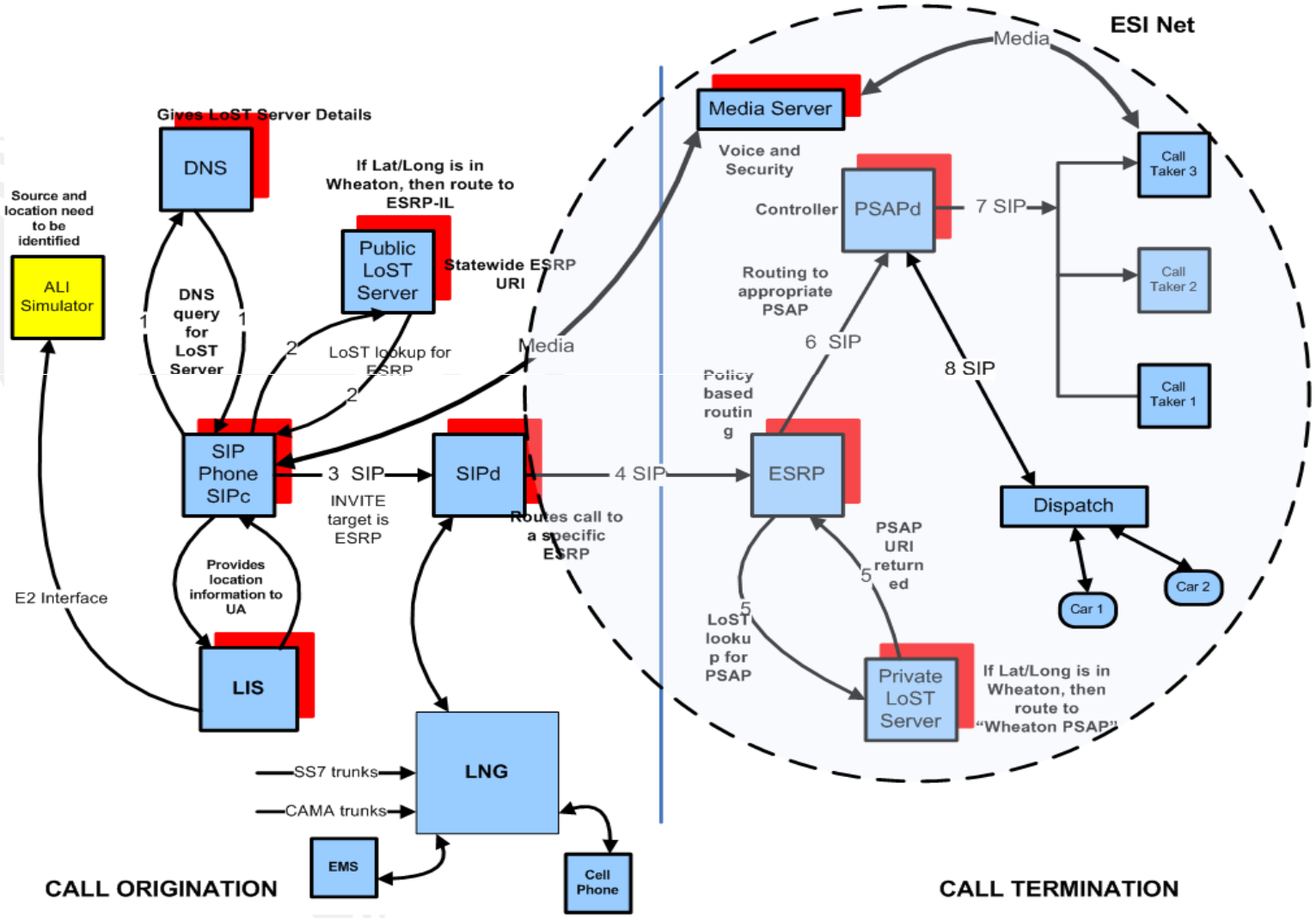
- Troubleshoot and stabilize the current ESINet test bed
- Create a plan for how to build a real-world ESI net that enables load balancing, perfect availability, and intelligent failover
- Document the installation of the architecture in order to easily be able to reproduce it
- Support others teams in their projects related to the NG911 architecture and in the implementation of new components

Context, references and related work

- NG 9-1-1 POC System Installation Guide by *Wonsang Song* at Columbia University
- NENA Functional and Interface Standards for Next Generation 9-1-1 Report
- "Failover and Load Sharing in SIP Telephony" by *Kundan Singh and Henning Schulzrinne*, CS Dept. at Columbia University

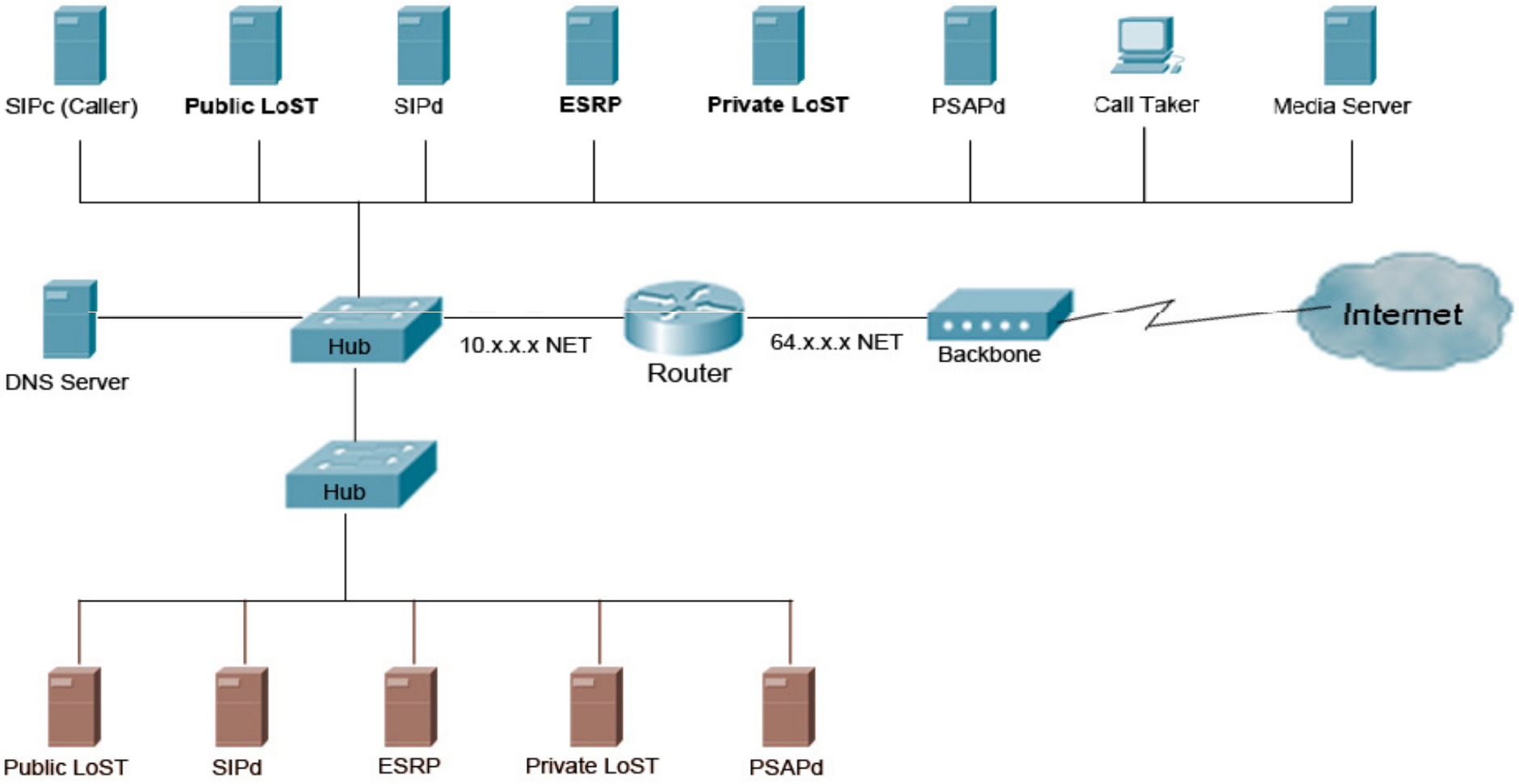
Logical Architecture

ILLINOIS INSTITUTE OF TECHNOLOGY

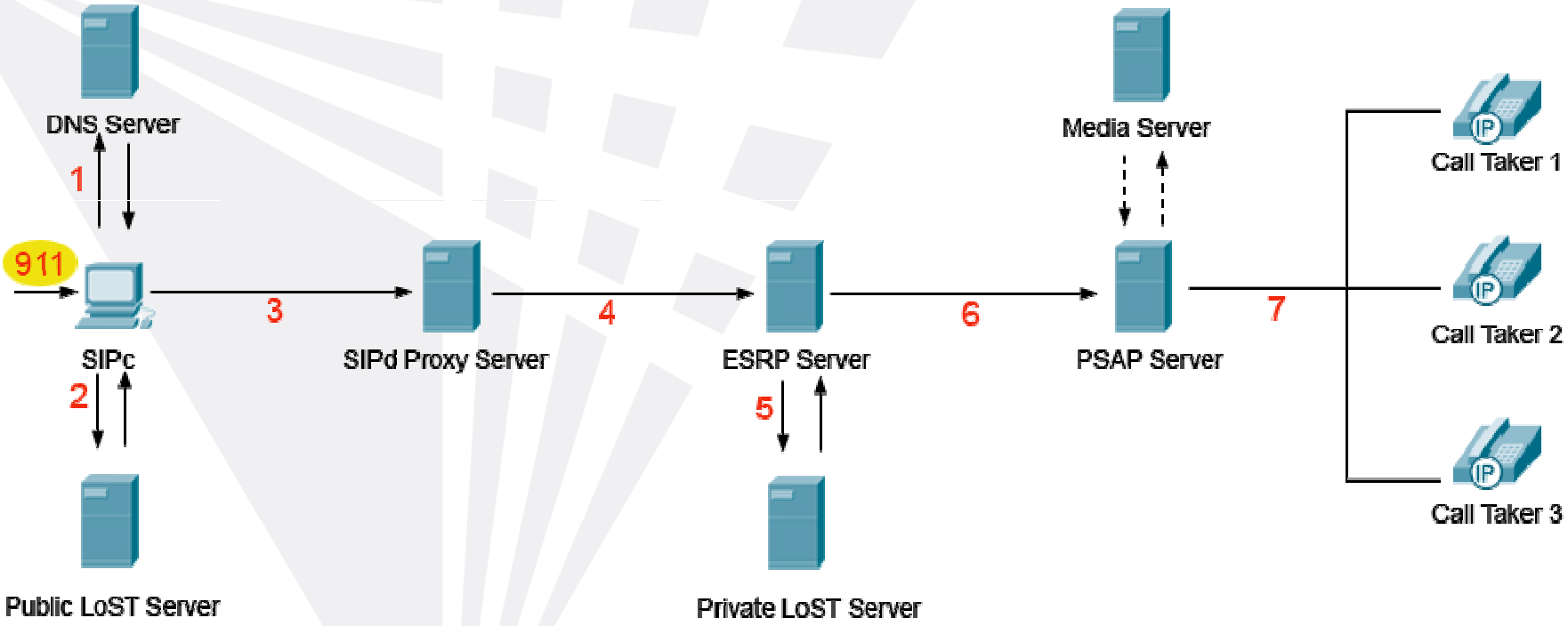


Physical Architecture

ILLINOIS INSTITUTE OF TECHNOLOGY

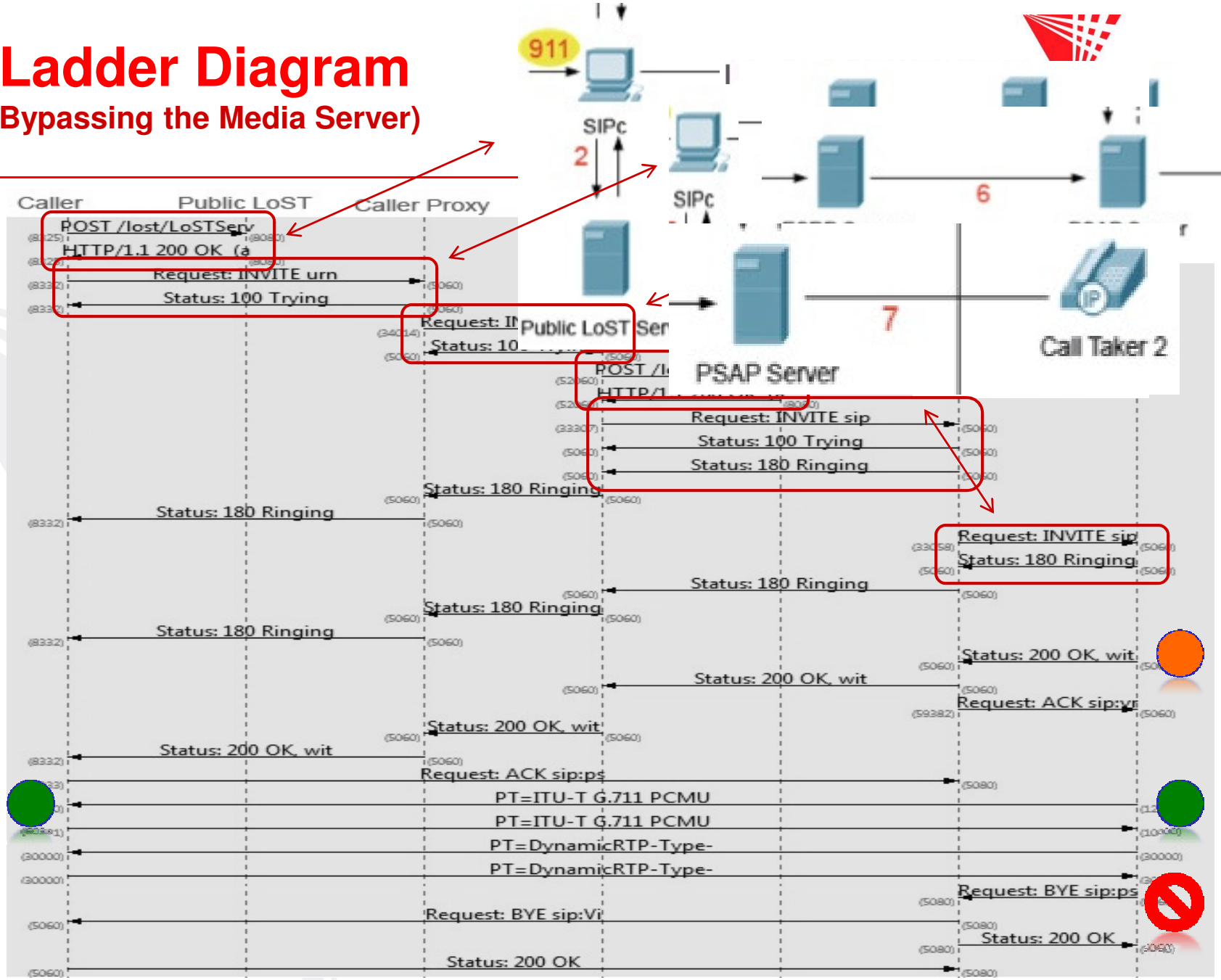


Information Flow



Ladder Diagram

(Bypassing the Media Server)



Support

- Support teams working on:

network management
virtual machines architecture
logging retrieval and analysis

Implementation

- Support the implementation of the LNG in association with Redsky.
- Databases modifications in order to prepare the testing of our architecture during ICE 8
- Implementation of our failover solution

Development of our failover solution

- The network management team explained earlier the necessity of a viable and powerful backup solution for an architecture like NG911
- Challenges

Application layer?

What type of failure(s) do we want to cover?

How do we do it in an efficient and intelligent way?

Development of our failover solution

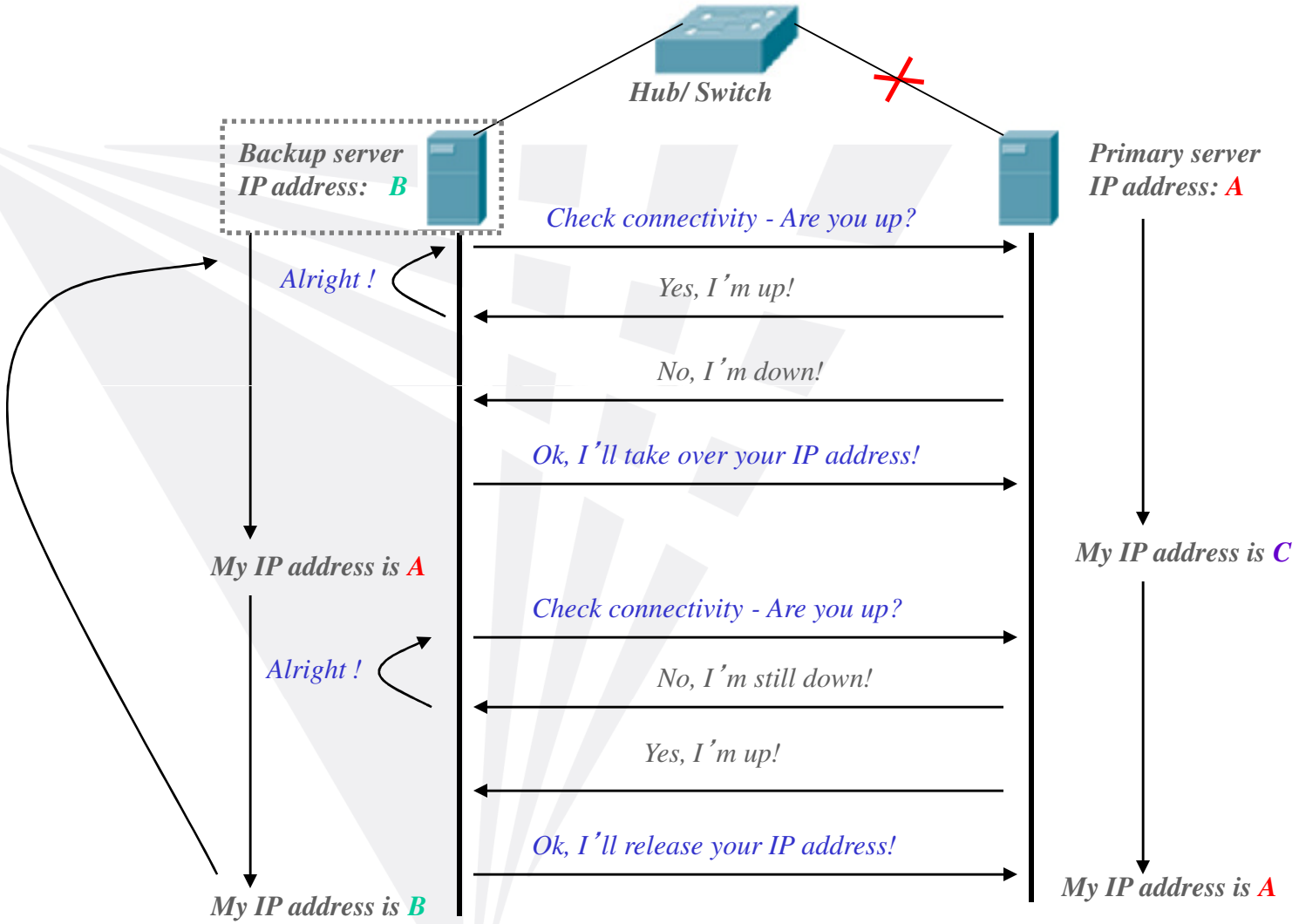
- IP address take-over solution was the right solution for us

NOT dependent of the application layer

Transparent

Easy to implement on our architecture

- Coded a BASH Script designed for this intelligent backup solution



Demonstration

Future work for our failover solution

- Next improvements for our IP address take-over include:

Monitoring the Application Layer as well to cover more types of failures

Reduction of the amount of traffic generated by our solution on the network

Improvement of the logging capability

Conclusion and Take-Away

- This project is an incredible opportunity for us to both learn and develop innovative solutions
- Stability of the architecture is a important responsibility that we take seriously
- Real-life implications for this project is very motivational
- Real-life engineering problem with our failover solution
- Integration of new components is challenging and requires a lot of support

Thanks to

- Professor Carol Davids
- Lab Manager Don Monte
- Project Manager Barbara Kemp
- Other NG911 teams and mentors

Questions ?

Thank you for your attention!