Title : Cloud Based Learning Framework for Academia

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Project Title: Cloud Based Learning Framework for Academia

Background :

- Cloud technology in academia is to manage effectively the technological needs of universities:
  - providing of virtual resources for students and faculties,
  - online learning system,
  - storage of data and computing and so on.
- Academia systems have *variety of data and also need many isolated network* for education services among universities
- Most institutions *need to share teaching and learning materials and also make research collaboration*

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Targets:

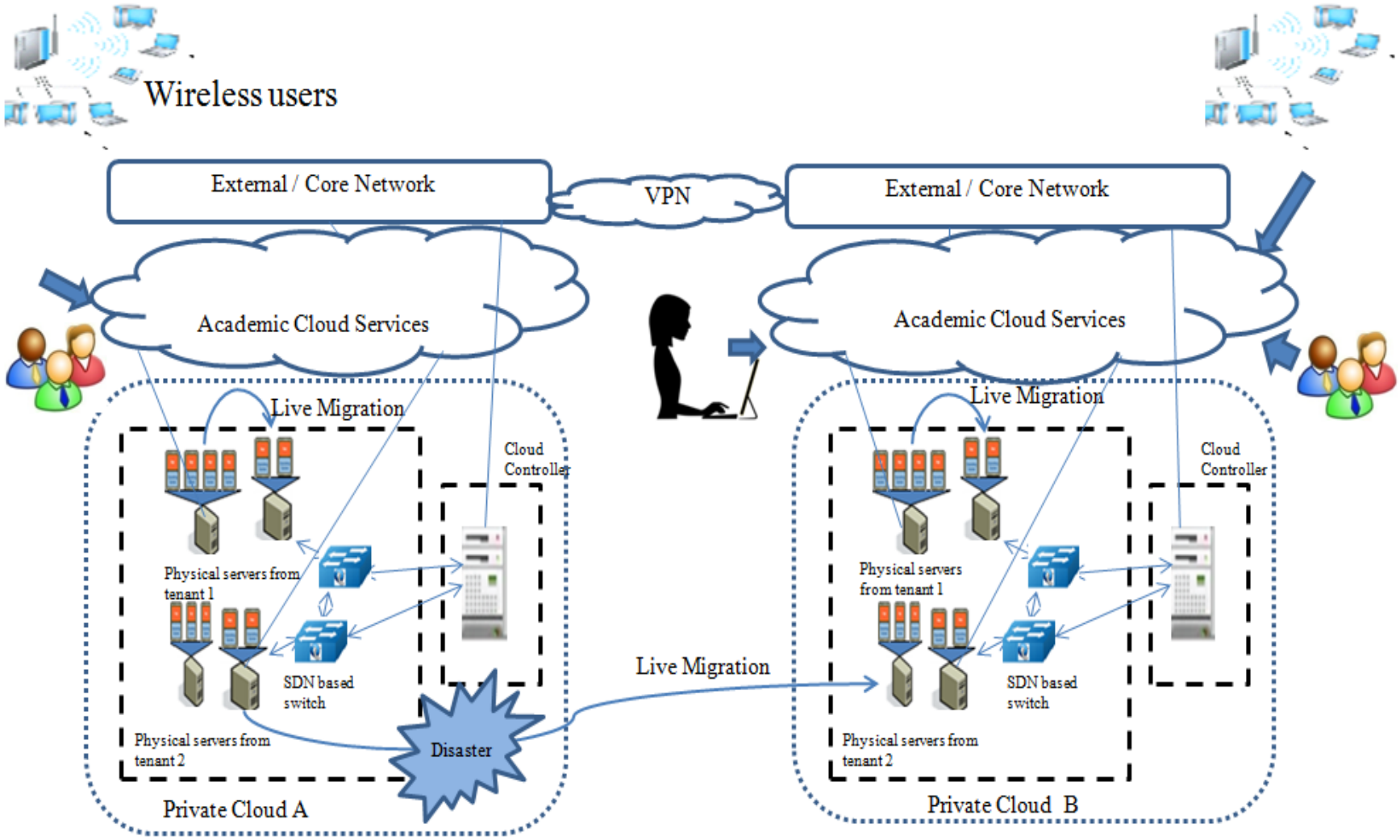
❖The cloud computing infrastructure is solutions that can adequate fulfill these requirements:

- ❑ To offer online learning and this framework addresses the services and development of cloud for helping the students, faculties, researchers and administrators of the university to better utilize their infrastructure
- ❑ To ensure the right people are accessing the right areas on campus using the blockchain technology to provide students with anytime/anywhere collaborative learning environment with a high level of security
- ❑ To be a plan for disaster recovery such as against earthquake, tsunami disaster and a heavy flood for cloud based learning environment using live migration mechanism between two private cloud infrastructures

Proposed Method: Cloud based Learning Framework with Disaster Recovery Plan

- ***Cloud Computing***
- ***SDN Concepts***
- ***Blockchain Technology in Cloud Framework***
- ***Live Migration Mechanism***

Proposed Method: Cloud based Learning Framework with Disaster Recovery Plan



Proposed Method: Cloud based Learning Framework with Disaster Recovery Plan

- This framework specifies the *virtualization* technology in order to use the resources more effectively.
- In this academic cloud can store educational records including transcripts, diploma, or personal students/teachers records, examination results, teaching material and so on.
- In order *to get the high level of security* for accessing the right people on right area *blockchain technology* is considered.
- It has been also *a plan for disaster recovery* for cloud based learning environment using *live migration mechanism* between two private cloud infrastructures.
- The proposed architecture *is based on cloud computing and SDN concepts*.

Proposed Method: Cloud based Learning Framework with Disaster Recovery Plan

❖For Disaster Recovery Plan

❖Own private cloud fabric has *several node machines* to get enough *fabric's redundancy.*

❖The computing resources and the data store resources are provided via VMs, and the resources are changed adaptively by the request from the administrators.

❖ The VM *can migrate between other private cloud fabrics*, and it is able to continue to keep running.

❖ A *live migration function* needs a *shared file* system to process the *VM's live-migration.*

Impact: Understanding Digital Network Architecture in Education

- The cisco SDN architecture can be considered for *SDN concept such as APIC-EM*
  - Advantage of this model is the use of open-source software so implementation costs for this solution are significantly reduced
- Nowadays, many universities collaborate with teaching and e-learning system, research activities and so on.
  - Latest technology, *Cisco Connected Mobile Experiences (CMX)* is used which use WiFi and location analytics technology

Impact: How benefit cloud blockchain Technology bring to Education

❖*Blockchain* systems frequently involve the use of cloud computing platforms.

- ❖ A ***permissioned blockchain*** is used for restricting/controlling the access of the stored record such as transcripts, diploma, or personal students/teachers records, teaching materials/courses, examination results and so on
- ❖ It may also include maintaining the identity of each blockchain participant on the network.
- ❖ Such blockchain control the participants' transactions and define their roles in which each participant can access to the blockchain.
- ❖ It is used for *restricting access to academic credentials and limit it to the intended participants only*.

Impact: Offering Disaster recovery plan using the cloud Framework

- Each private cloud fabric has *private cloud controller* which constructed *live-migration function.*
- *VPN connection* makes connection between both private cloud fabrics.
- As a result, both private cloud fabrics are organized same cluster logically.
- Open Flow switch is used for *making optimum path dynamically between several private cloud fabrics.*
- The cloud controller has functions, there are *catching earthquake alert notification* via cell-phone carrier using smartphone function.
- Then, cloud controller *makes live-migration command* for target node machine, and sending command to the target node machine.
- The service running on *private cloud A is migrated to private cloud B.*

Output/Outcome

- The cloud based academia framework is presented for providing richer learning experiences *gaining real-time, actionable insight into student performance with high security*
- This framework is *also helpful for disaster recovery between two private cloud infrastructures.*

Conclusion:

- All recent research and developments, ***cloud-computing technology*** is still evolving.
- In the same way, education system is also promoted by use of technology, in such a way that information is distributed and knowledge is shared between students, researchers and faculties.
- Cloud Computing Technology has emerged as a meaningful technology by providing infrastructure and software solutions for the ICT needs of University via internet.
- So, ***the cloud computing infrastructure is a solution*** that can adequate fulfill for sharing teaching and learning materials and also research collaboration.
- In order to provide network programmability ***SDN concepts must be used too*** in proposed framework.
- Additionally, ***the blockchain technology*** is considered for *high security and integrity*, building a collaborative atmosphere for all parties including students, faculty members, and authorities.
- Moreover, this framework has also been ***a plan for disaster recovery*** for cloud based learning environment *using live migration* mechanism between two private cloud infrastructures.

Thank You So Much For Your Kind Attention