

Enterprise Capable Virtual Training Environments

“Next Generation Distance Learning”

11 July 2007

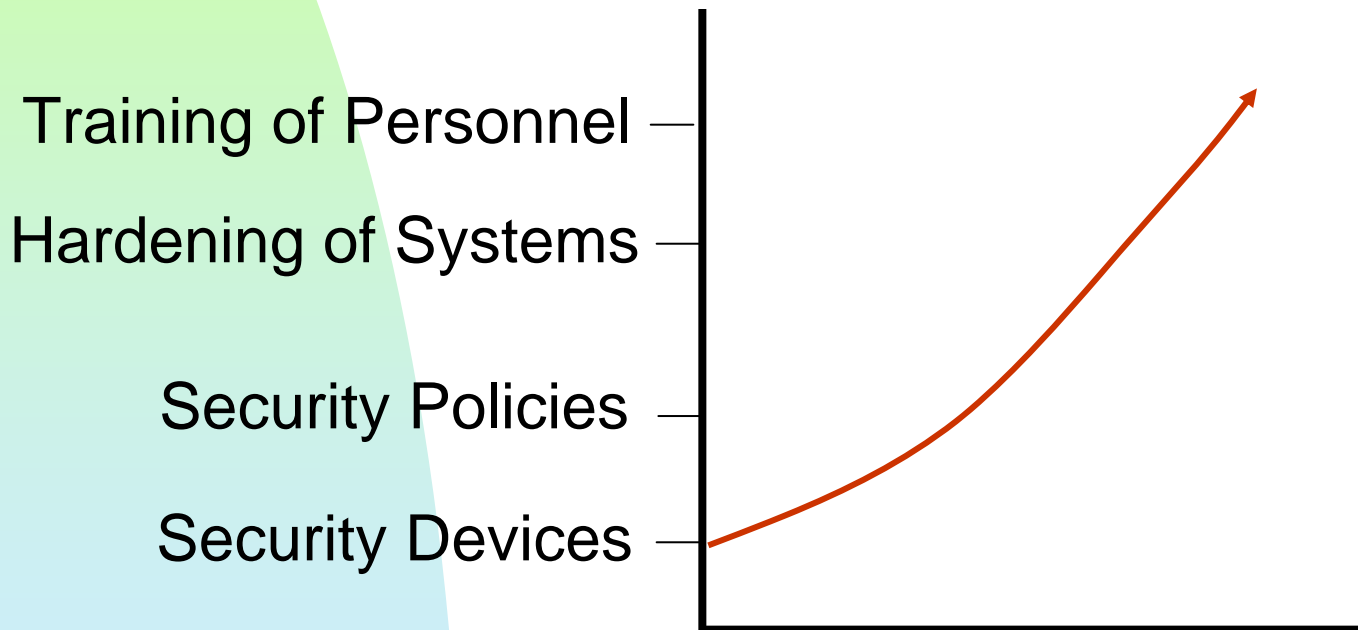


What, Why and How



Issue #1 - How do you demonstrate the importance of IA Training?

The Effectiveness of Various Security Measures



* Working draft that is not yet based on factual numbers

What is a basic Virtual Training Classroom?

Providing students the use of Virtual Machines during their instruction usually on a desktop or laptop in a classroom.

Benefits to Instructors:

Eliminates the need to reload and prepare the students workstations after each student has completed training.



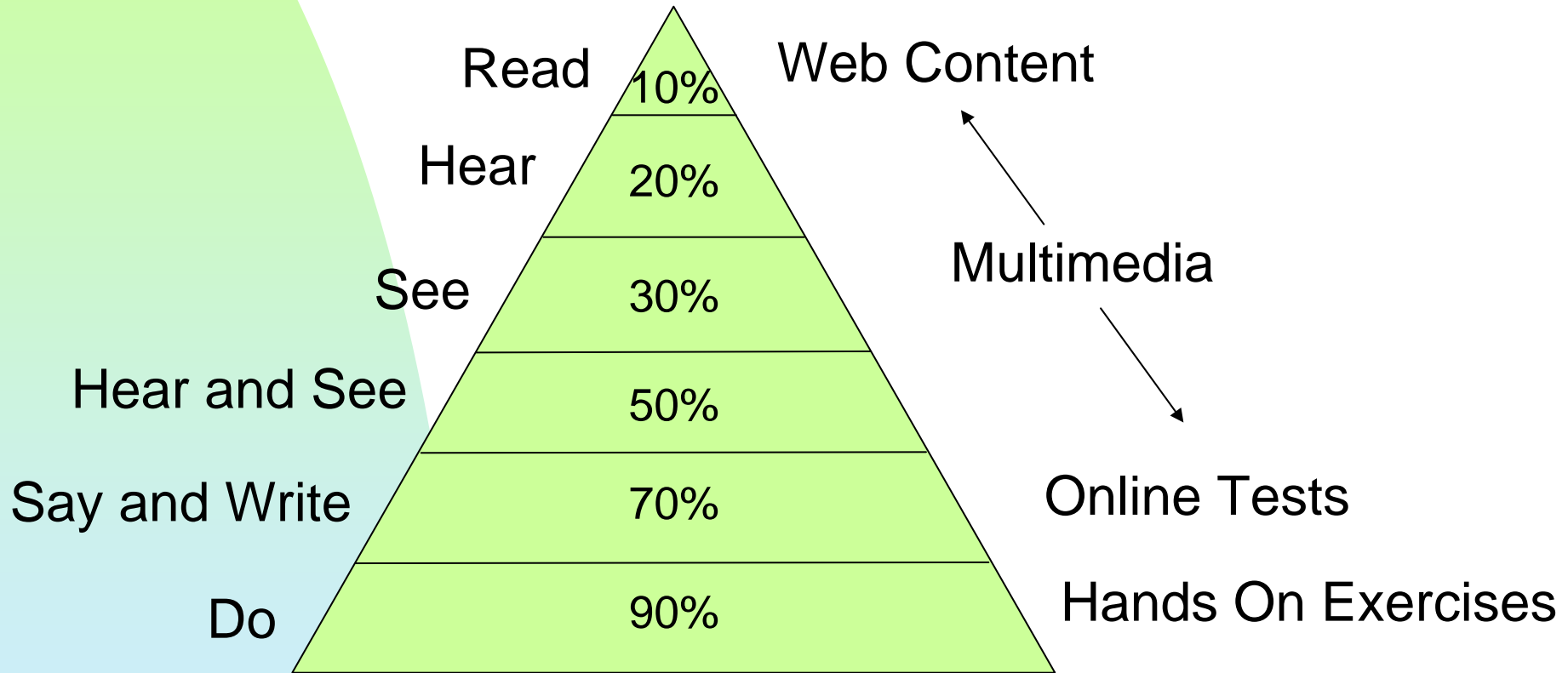
What is an Enterprise Capable Virtual Training Classroom?

A classroom that can provide virtual machines across the internet in a scalable and automated fashion.

Distance Learning Formats are here to stay. So delivery of the lab along with the content via the web is desirable and beneficial.



The Effectiveness of Various Types of Learning Environments



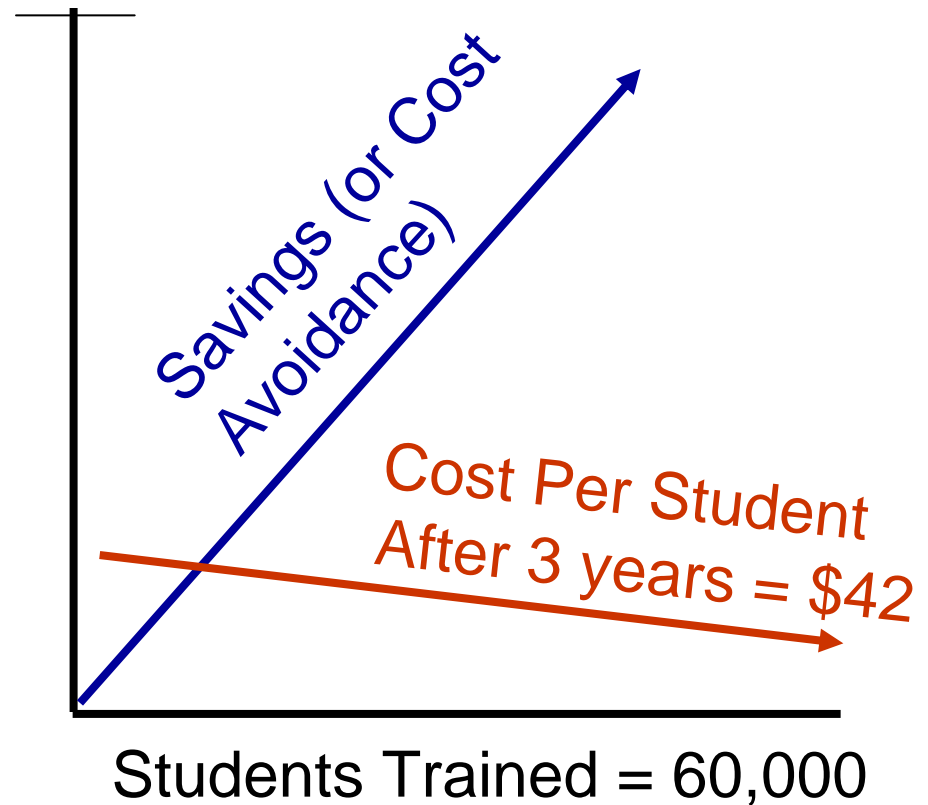
Financial Benefits

(A CASE STUDY)

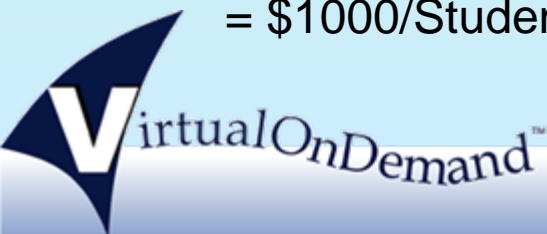
The savings added up when a VirtualOnDemand classroom replaced using traditional classrooms!

Savings estimated using the formula that by saving on Course/Lodging/Travel and time away from duty station for each student the savings = \$1000/Student

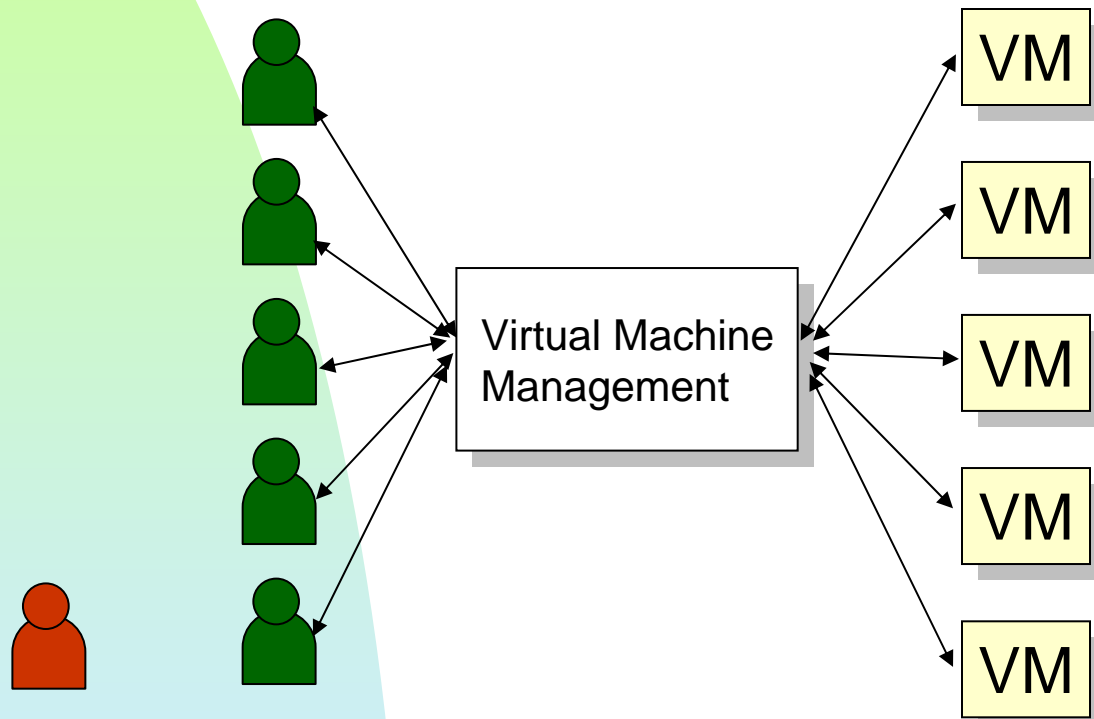
Savings = est.
\$60,000,000



*figures are based on a case study of an actual NACON customer.



License Management



Delivery Mechanisms

(How to)

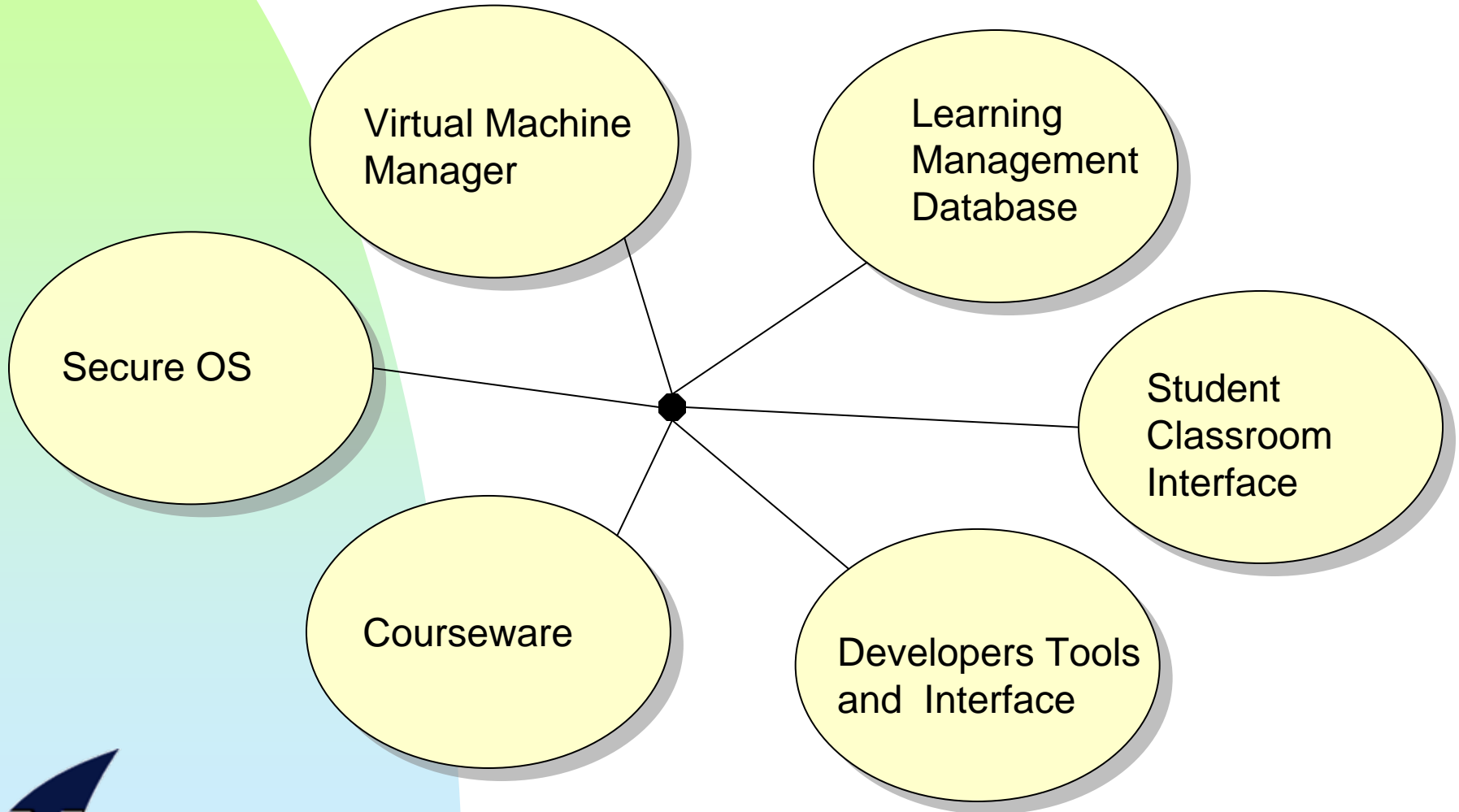
Components and Techniques for an Enterprise Level Virtual Training System.



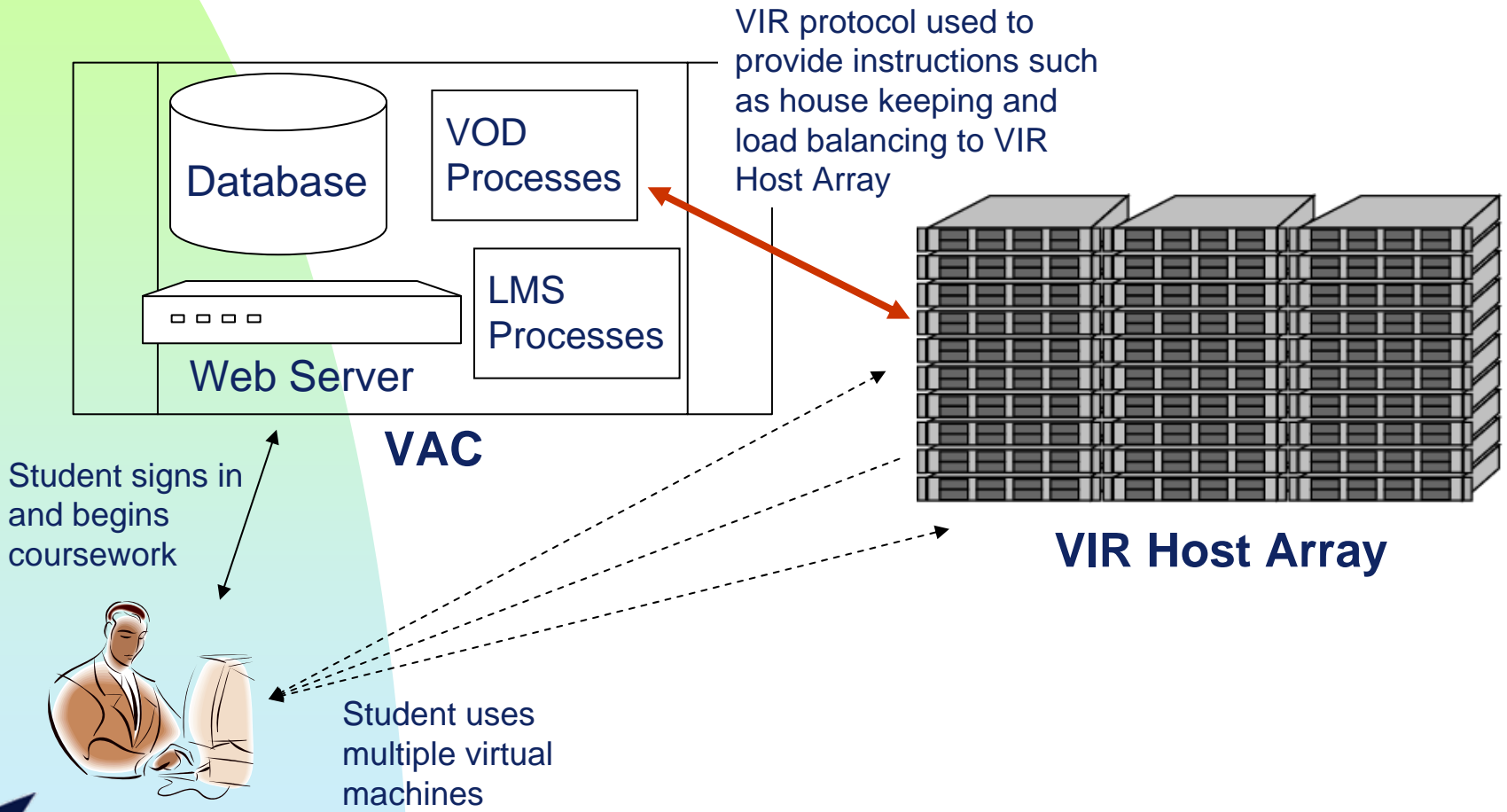
Requirements Based Definition:

1. Provision virtual machines automatically (startup and cleanup, aka - “housekeeping”);
2. Allow multiple students to take same or different courses simultaneously (load balancing and network isolation);
3. Maximize the hardware resources of the classroom;
4. Allow persistent mode VM operations;
5. Provide flexibility in associating different VM’s with different courses;
6. Allow for capacity expansion on the fly;
7. Learning Management System (LMS), scheduling and administrative tools.

Classroom Components

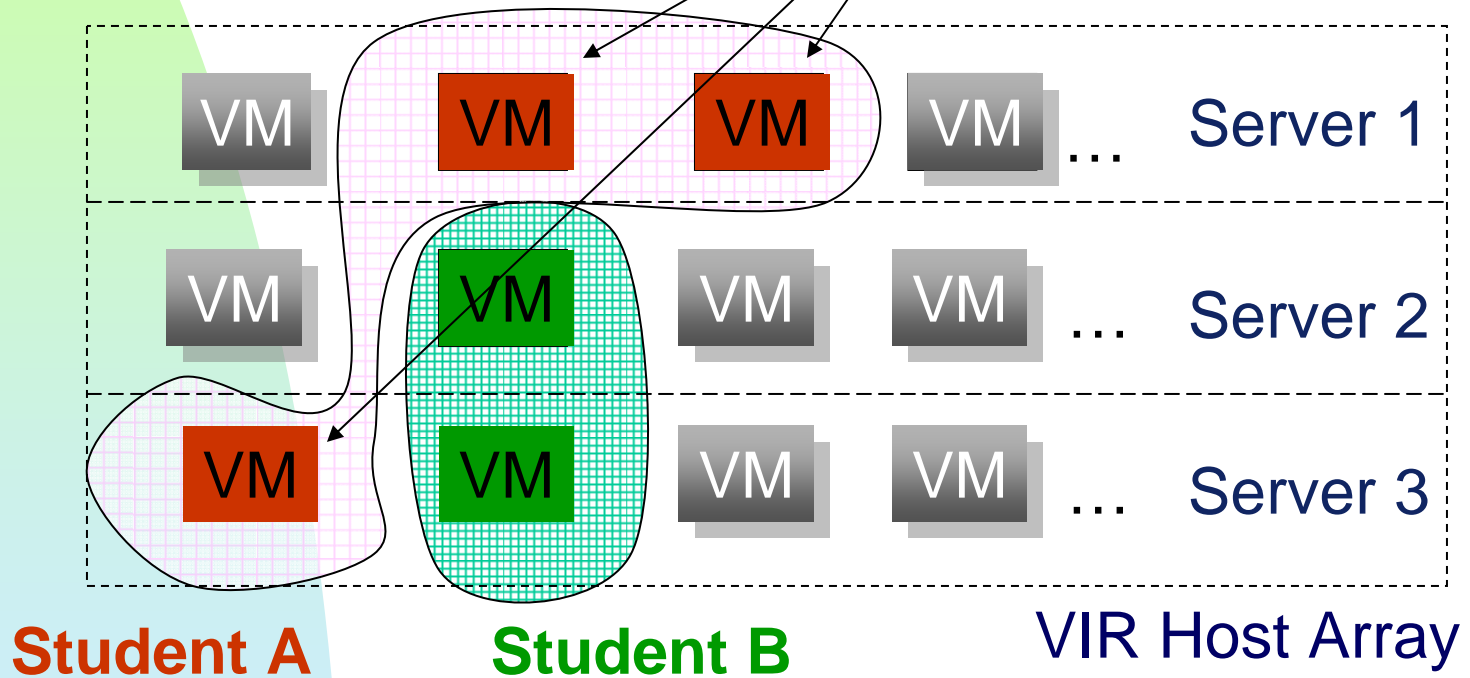


Overview of an “Enterprise” VM classroom environment.

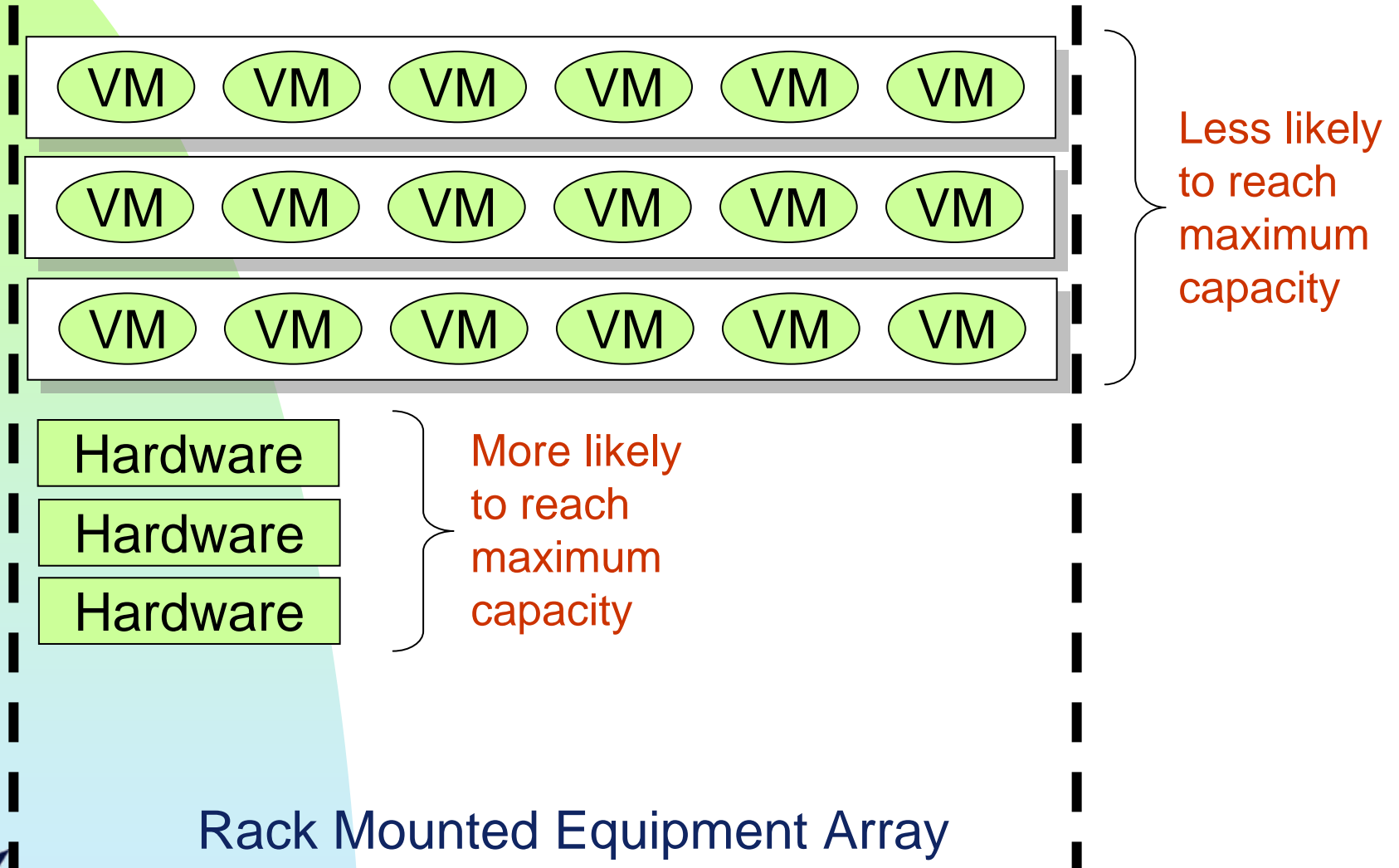


Network Isolation and Load Balancing

VM's for each student isolated into a private network



Scheduling Algorithms



Industry Wide Issues

- **Language**
 - **What IS virtual? Industry needs to de-conflict the term virtual as it relates to VM's vs. simulations such as Flash movies**
 - **Jargon (for example we “spin up” or “provision” VM's)**
- **Customer understanding of the benefits of Virtual Machine based training and their perceptions.**
- **LMS Data Exchange (This is your call for participation for those interested).**

What's Ahead

- Built in virtualization on chips;
- Better networking within the virtual environment;
- Advances in delivery mechanisms (latency)
- Interoperability between classrooms

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