The VITELS Module Structure: A case study

Attila Weyland

Rechnernetze und Verteilte Systeme

Institut für Informatik und angewandte Mathematik

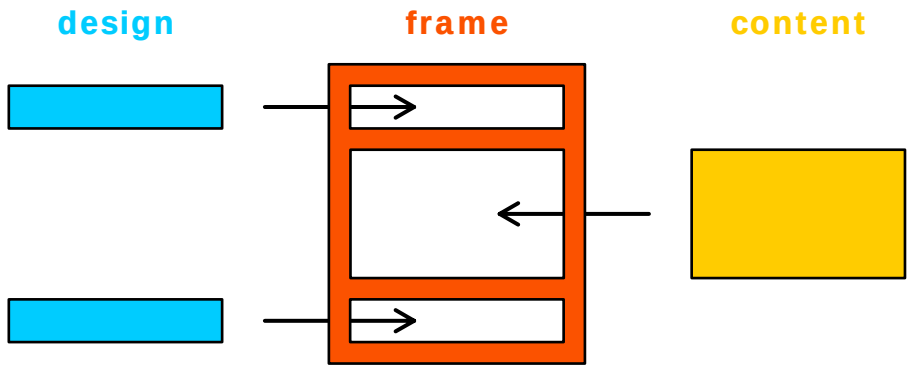
Universität Bern

Contents

- Didactics and Design Requirements
- Common Course Layout
- Case study based on the module “Simulation of IP Network Configuration”

Didactics and Design Requirements

- Common structure and design for all modules throughout the whole VITELS course
  - Centralized layout and design (Cascading Style Sheets, PHP framework)



- Student should reflect as much as possible to activate the learning process
  - Personal Synthesis, Logbook (Essays)

Common Course Layout

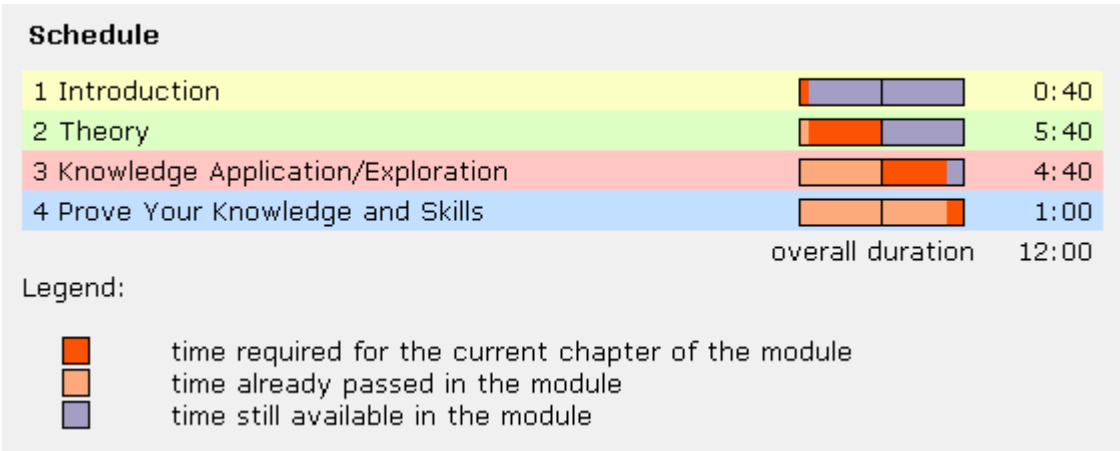
- Introduction
  - Own learning goals
  - Learning goals
- Theory
  - Synthesis
  - Self test, test
- Knowledge Application/Exploration
  - Lab
- Prove Your Knowledge and Skills
  - Synthesis
  - Test

Preparation

- Chapter 1: Introduction
  - Welcome
    - Abstract, special requirements, authors
  - The Goals and how to Reach Them
    - Goals, storyboard, schedule
    - Students know what they will learn and also how much time it takes them
  - Module Vicinity
    - Position map, mind map
    - Maps show the logical order of all modules and a modules relation to the rest of the course
  - My Goals
    - See what students expect and knowledge already available
  - Tips
  - FAQ

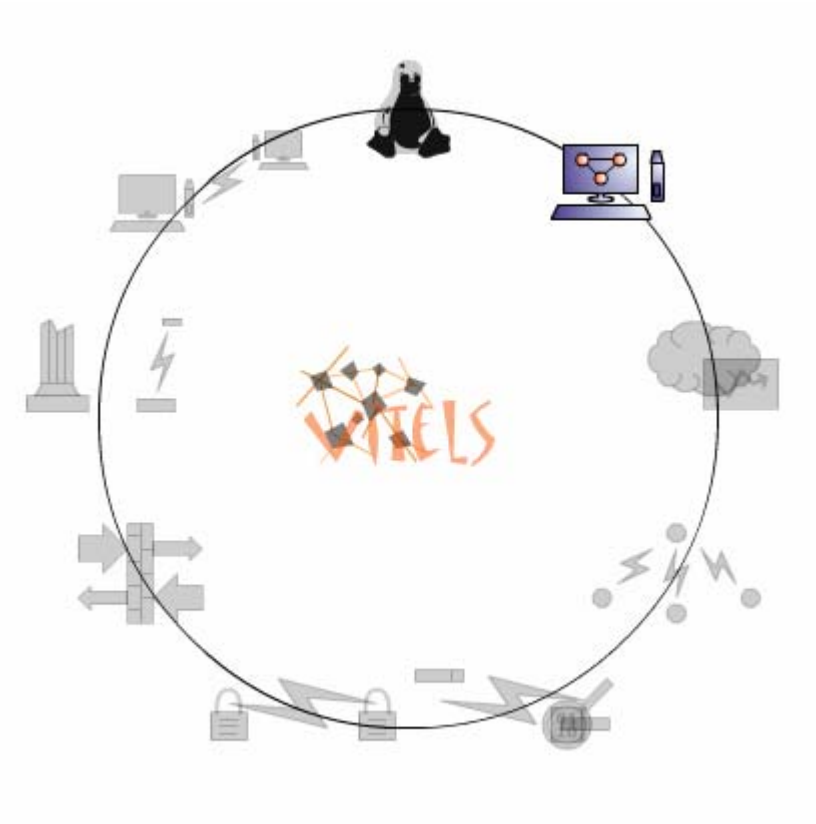
The Goals and How to Reach Them

- Goals
  - You optimize routing table entries, add and correct interfaces and routing table configurations until having solved the simulation exercises.
- Storyboard
  - In today's computer networks the prevalent underlying network technology and interconnecting protocol is Ethernet and IP, respectively.
- Schedule

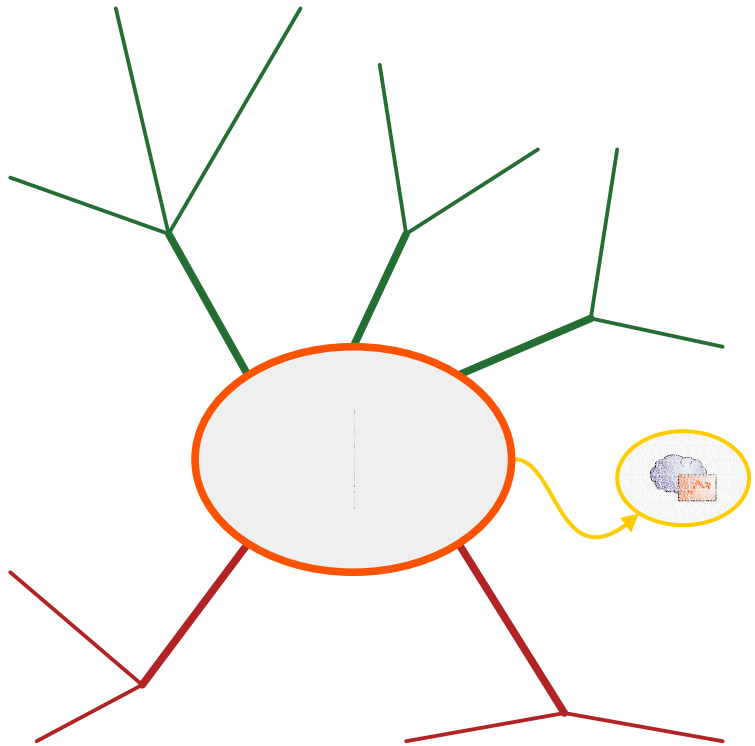


Module Vicinity

- Position Map
  - Shows current module in relation to other modules



- Mind Map
  - Shows key words from the Theory and the Hands-on Session
  - Shows required and following modules

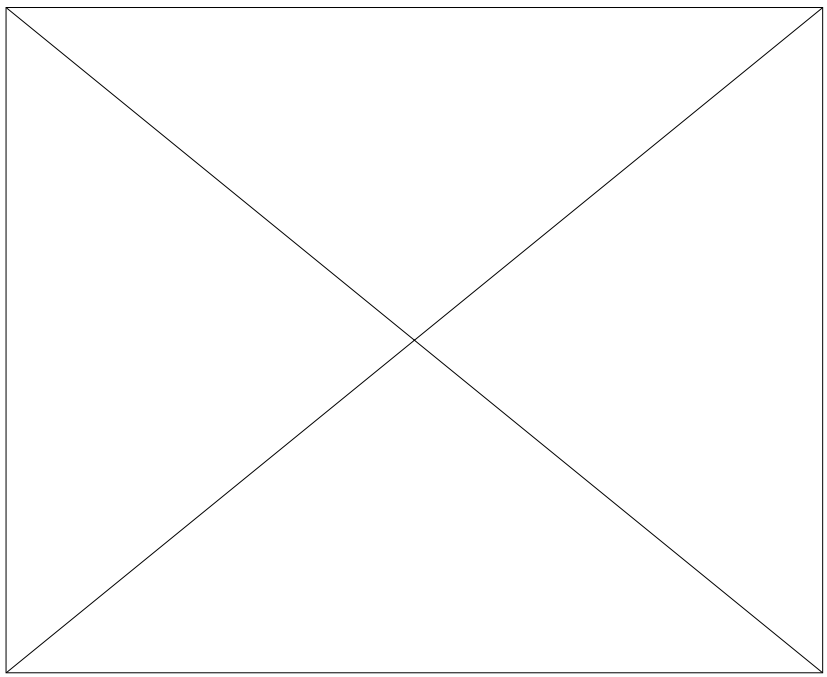


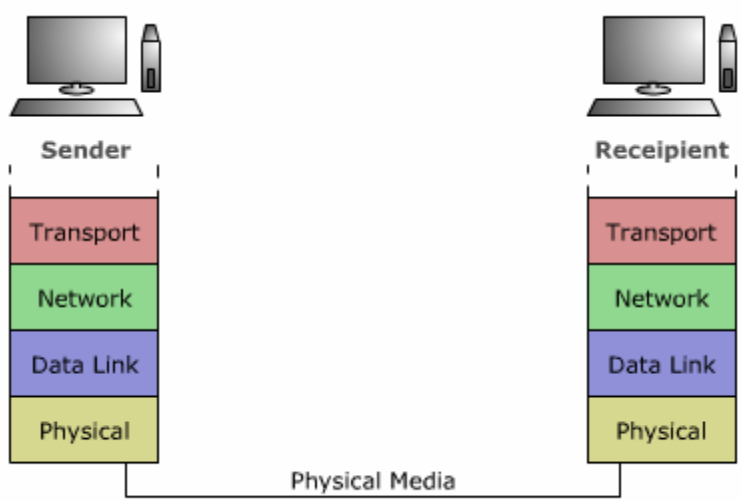
Acquiring Knowledge

- Chapter 2: Theory
  - Theoretical Basics
    - Provide necessary knowledge for the hands-on session
  - Readings
    - Students get familiar with scientific literature
  - Personal Synthesis
    - Students write down what they know or have learned and organize their knowledge
  - Self-test
    - Helps students to orientate in the theory part and to discover missing parts
  - Quiz
    - Helps tutors to discover missing theory parts or to discover lazy students.

Basic Networking Concepts

- ISO OSI and DoD Model Data
- Data Encapsulation and Decapsulation





Self Test

- Helps students to orientate in the theory part and discover missing knowledge

Self Test

Multiple Choice Questions

1. **Protocols**
   Which protocols operate at the ISO OSI network layer?
   - ○ Border Gateway Protocol, Router Information Protocol, Open Shortest Path First
   - ○ Transmission Control Protocol, User Datagram Protocol
   - ◉ Address Resolution Protocol, Carrier Sense Multiple Access with Collision Detection
   - ○ Internet Control Message Protocol, Internet Protocol
   - ○ 10 Base-T, 100 Base-TX

Feedback

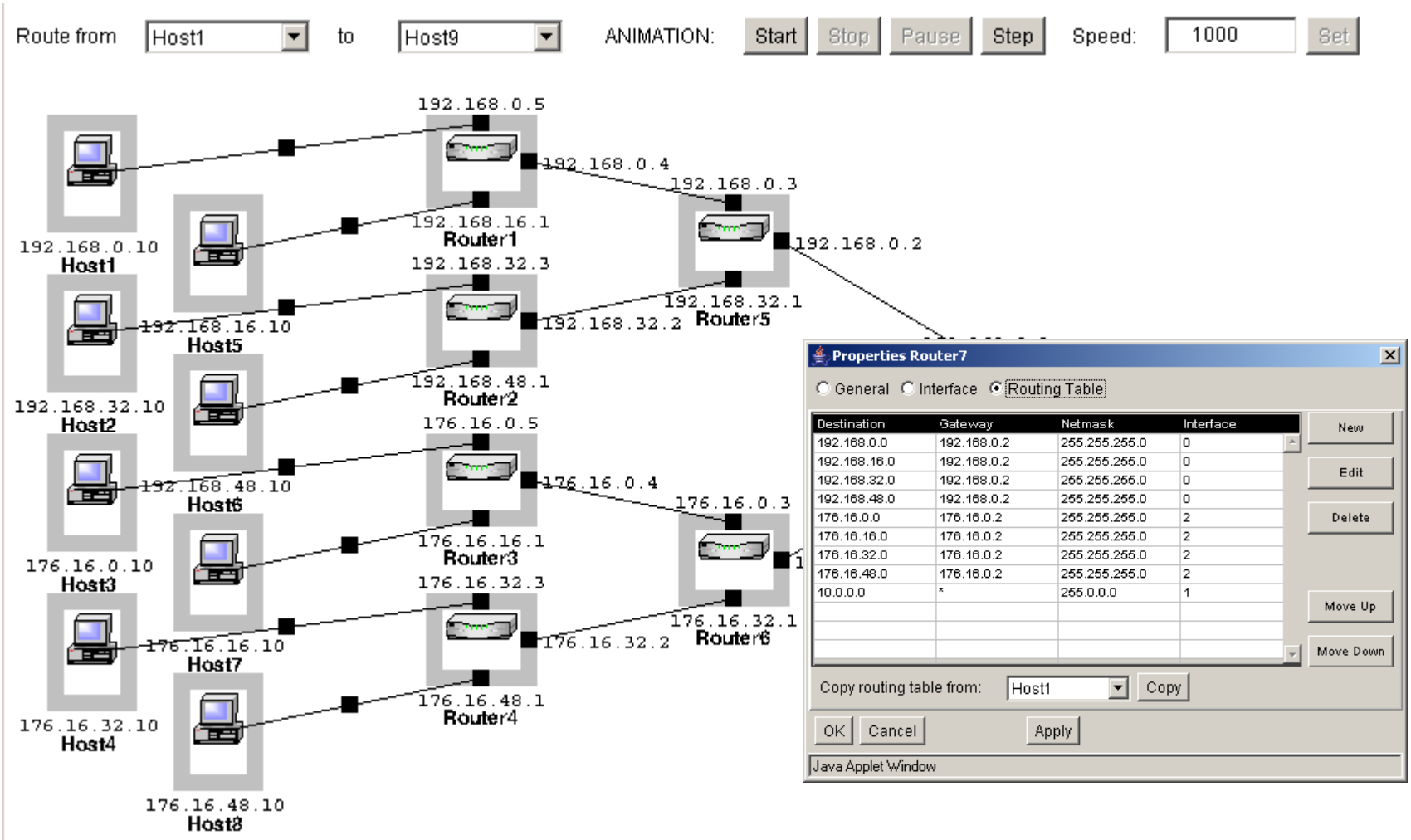
Incorrect
Incorrect. ARP and CSMA/CD are protocols of the data link layer (see Theory sections 1.1.1 ISO OSI and DoD Model, 1.2.1 CSMA/CD Operation and 1.4.1 Address Resolution Protocol).

Working in Practice

- Chapter 3: Knowledge Application/Exploration
  - Hands-on Session
    - Apply the theory and trial-and-error learning

Configuring IP Networks

- IP Routing Simulator



Configuring IP Networks

- IP Network Emulator using Virtual Routers

Evaluation

- Chapter 4: Prove Your Knowledge and Skills
  - Personal Synthesis
    - Students express in own words what they did
  - Final Quiz
    - Analyze what students really understood

What's next?

- Apero and individual module presentations