BSD Professional Certification Update: the Lab Exam

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Topics

- Intro (Who/What/Why/$$$/Psycho)
- BSDP Exam Design
- BSDP Lab Design
- Prototype and Demo
- Future Directions
- How you can help
- Discussion

Who/What/Why

- The BSD Certification Group exists to provide psychometrically valid exams for BSD system administrators.
- Incorporated in 2005, NJ, USA. Formal IRS status- 501(c)6 a.k.a. “Business League”. Contributions are *not* tax deductible. We really, really tried... :-(
- BSDCG began in 2005; BSD Associate Exam released in 2008.
- BSD Professional Exam development finally (!) getting fully underway in 2010.
- Other exams under consideration

$$$

- The “Why” - Sorry, we're not in it for the money :-)
- The BSD Certification Group survives on public donations, purchases of our custom DVDs, corporate sponsorships, and individual goodwill.
- By The Numbers:
  - **2007: Income: $5,996 : Expenses: $9,046 (Psych: 82%)**
  - **2008: Income: $9,425 : Expenses: $12,267 (Psych: 70%)**
  - **2009: Income: $9,255 : Expenses: $13,632 (Psych: 67%)**
- Fortunately, every year we have been able to meet our psychometric expenses.
- Please Donate! But there is more than one way you can help...

Why Psychometrics?

- A psychometrically valid exam represents the highest level of exam design excellence.
- Psychometric exam design is the right choice for professional settings and credentials.
- Future directions for BSDCG require psychometric exam design, and structured business design (similar to ITIL).
- These are required for program accreditation by ANSI and ISO (ISO/IEC 17024).

BSDP Exam Design

- ☑ Psychometrician- Dr. Sandra Dolan
- ☑ Job Task Analysis for BSDP
- ☑ Created Exam Objectives for BSDP
- ☐ Create Exam Questions (Need SMEs for all BSDs)
- ☐ Exam Beta Period (Need 100 testers including You!)
- ☐ Anghoff Session – figuring percentages
- ☐ Set the Passing Score
- ☐ Launch!
- ☐ Ongoing Tracking and Modifications of the Exam

BSDP Lab Concept

- BSDCG has been considering a “hands-on lab” for some time.
- Ideas have been drawn from several sources, notably CCIE.
- Everyone is encouraged to submit ideas and get involved.
- Not all ideas are workable for BSDCG, since we are a non-profit organization with limited resources.

BSDP Lab Concept

- General idea is based on a lab booklet that outlines a set of real-world scenarios.
- Each scenario has one or more tasks.
- Each task has a point value.
- To pass, candidate must accumulate points.

BSDP

BSD Professional Lab Examination
v 0.1

Introduction
The BSD Professional lab examination is designed to test competence in setting up BSD systems according to requirements. Candidates are provided with virtual guest systems to perform tasks. Candidates may utilize either AQEMU, or VirtualBox for managing virtual systems.
...

General Scenario
"Example Inc. manufactures and sells widgets and uses BSD systems to run its manufacturing plant and business operations.

You have just been hired as the senior system administrator for Example Corporation. There has been a major systems disaster and your boss, Mr. Big, demands that you get the company back into operation as soon as possible."

Mr. Big has provided you with four BSD servers:
- **sysa** - a DragonFlyBSD server running 2.6.3
- **sysb** - a FreeBSD server running 8.1
- **sysc** - a NetBSD server running 5.1
- **sysd** - an OpenBSD server running 4.7

and an additional blank virtual machine.

The above machines have been installed, but not configured in any way beyond setting a root password- *bsdcg*.

Mr. Big has a list of tasks that are required to get the company operational. **Each task requires you to perform the actions listed as described.** If a specific host or a specific application is identified in the task, it must be used. If not, you are free to use any host and any application that meets the requirements.

Example Task (do not perform this task):
- Download the user and group accounts list at http://10.10.10.10/accountlist.txt and create the groups and users specified on **sysc**.

I.	Task One ...	
	Task Two ...	
II.	Task Three ...	

BSDP Lab Requirements

- 1 – Lab must match the exam objectives.
- 2 – Lab must be proctored.
- 3 – Lab must be “low cost” to BSDCG, candidates, and proctors.
- 4 – Lab must be simple to set up, take down, and administer. Minimal baggage.

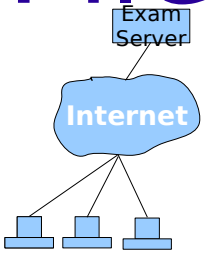
BSDP Lab Requirements

- 5 – Lab must focus on “services” not “software products”.
- 6 – Lab must be reliable. No SPoF at test time.
- 7 – Lab must be secure- before, during and after the exam.

BSDP Lab Requirements

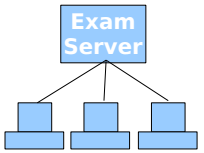
- 8 – Lab must be easy to score (i.e. scoring should be automated, similar to vulab).
- 9 – Lab must be doable anywhere- Internet access must not be required.
- 10 – Lab must not be predictable. (Can't preload test results or services.)
- 11 – Lab must be as close to real world requirements as possible.

BSDP Lab Ideas Pile

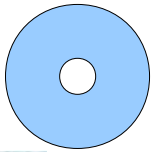


- Online “Virtual Lab” (proctored)
- BSDCG Owned Physical Lab Centers

- Single Server, Multiple X-sessions



- Live CD/DVD with virtual exam

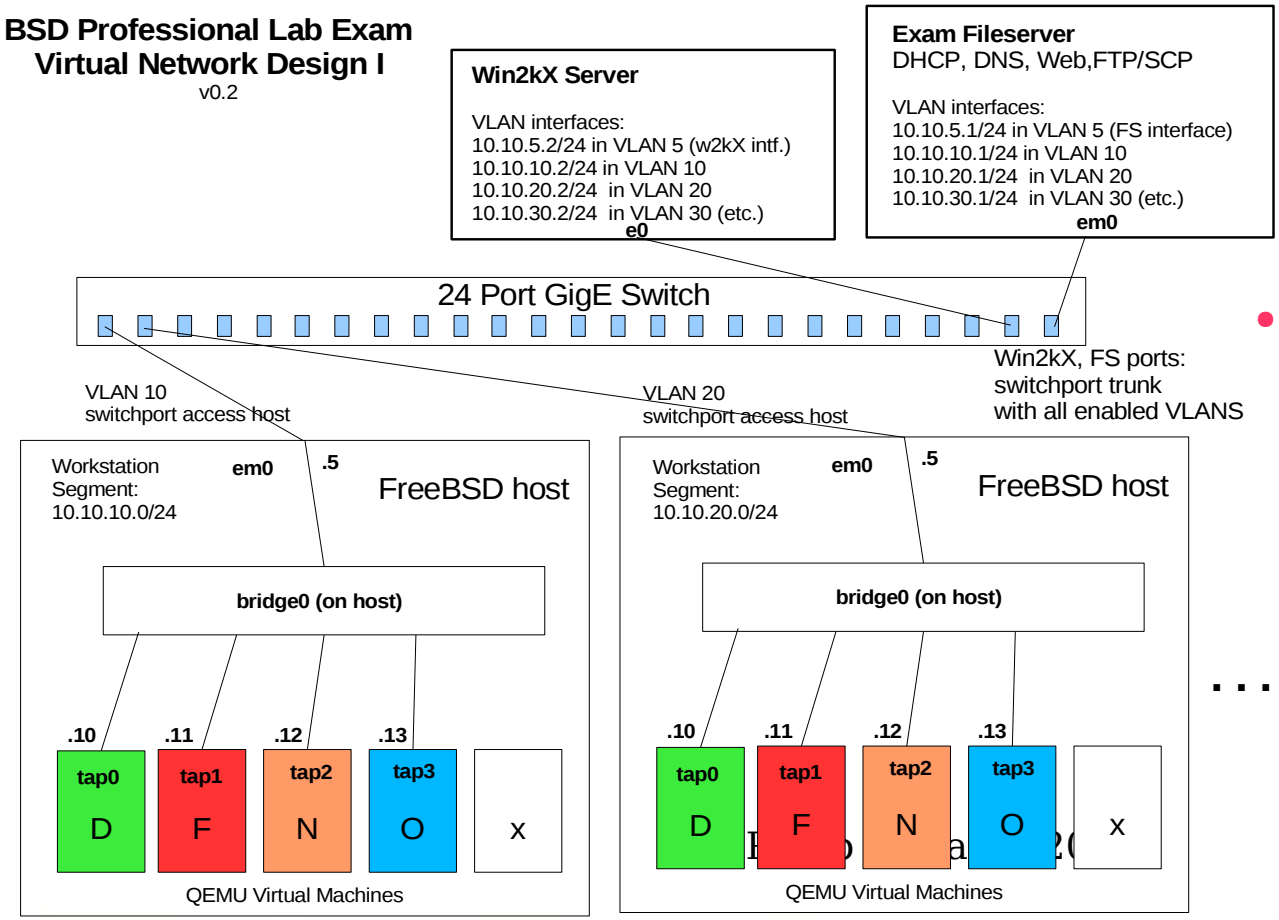


- Candidate provided laptop+ BSDCG provided USB

- BSDCG Provided Laptops/Hardware

BSDP Lab Physical Design

- The physical design consists of 10 desktops or laptops connected via 24 port switch, with 2 exam servers also attached (Win 2kX, BSD).



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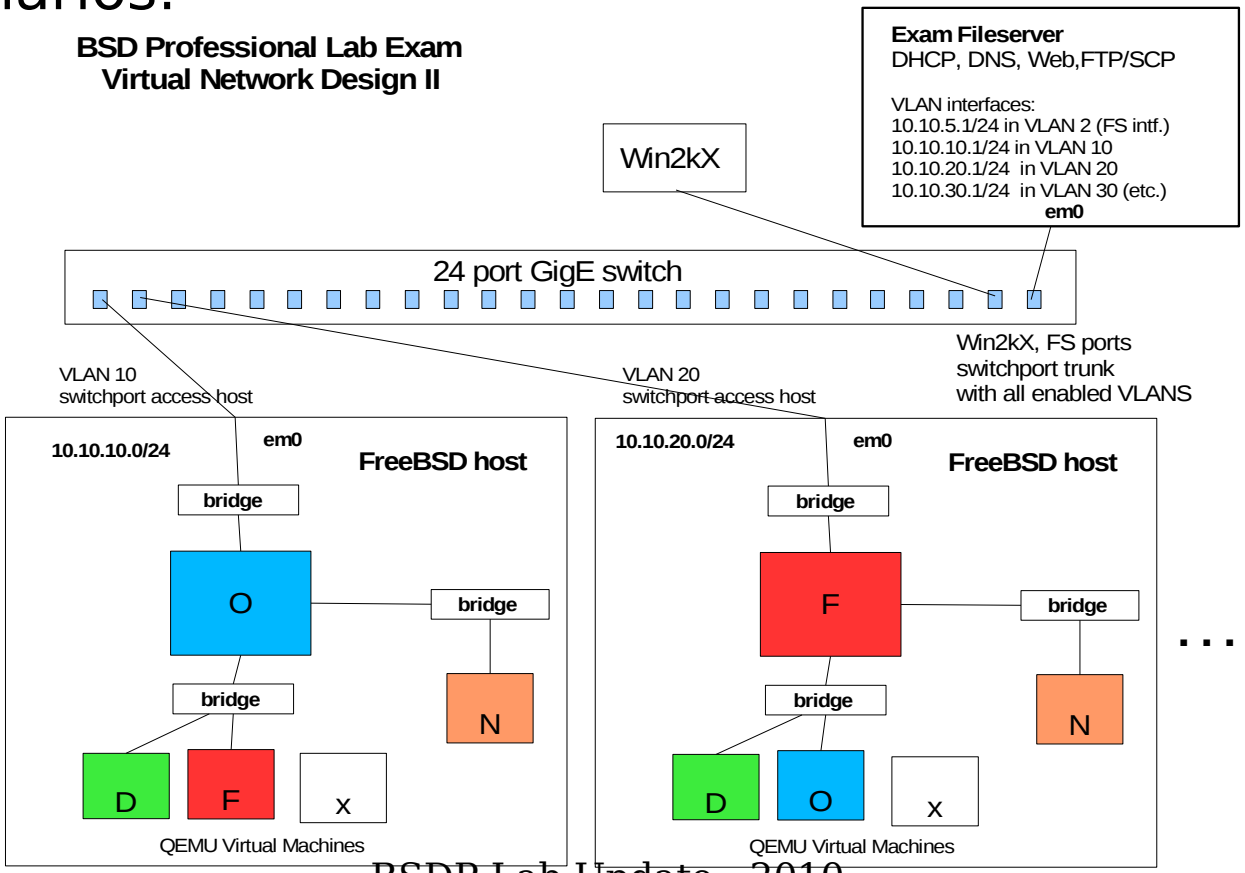
- Each VM host contains 5 VM guests. Guests utilize tap and bridge devices to facilitate communication.

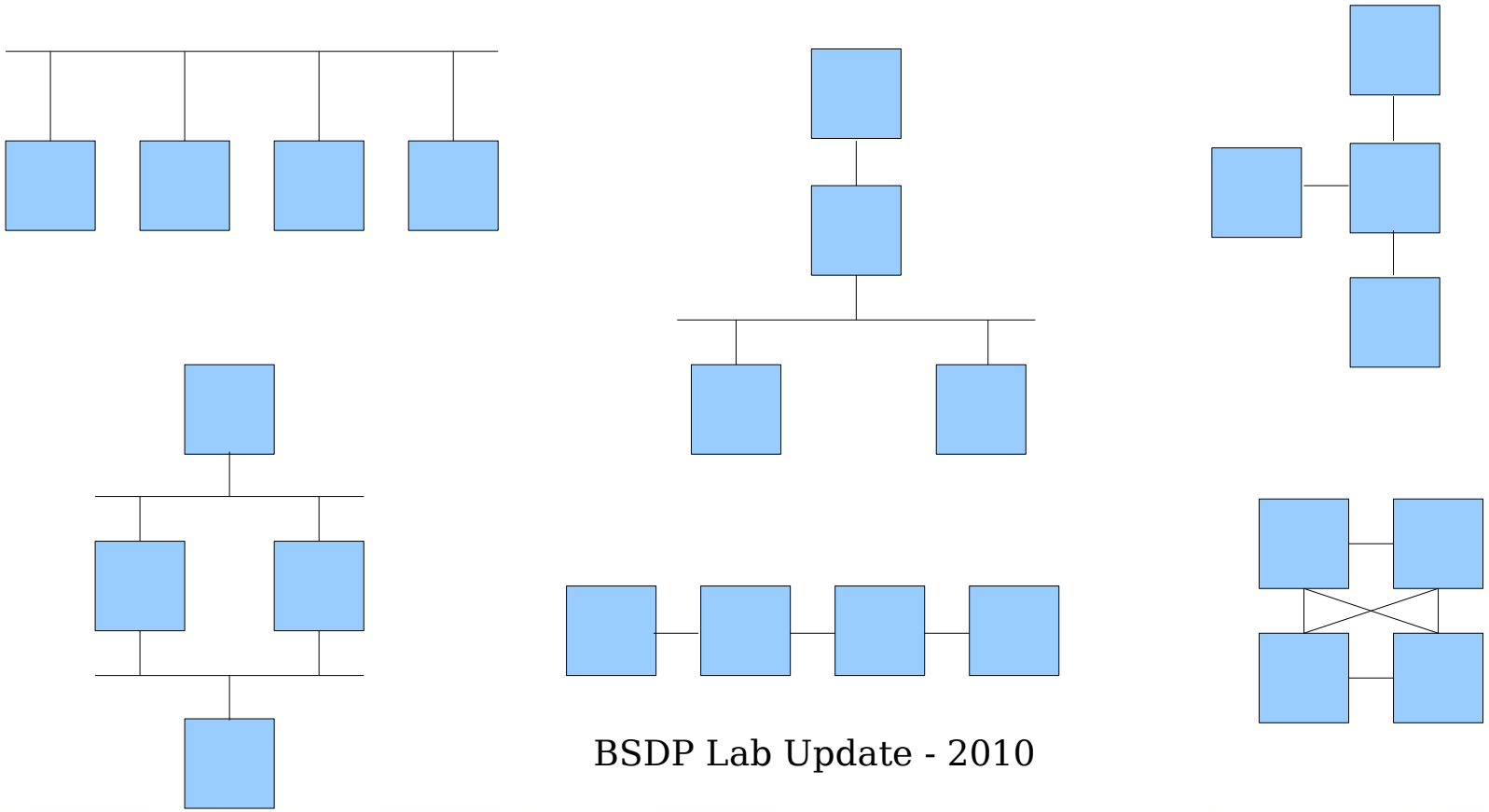
BSDP Lab Physical Design

- Candidates may have to configure more than one bridge on the VM host in certain Lab scenarios:



BSDP Lab Possibilities

- Four virtual machines offers many interesting networking and administration possibilities. (Five offers even more.)



BSDP Lab Package Contents

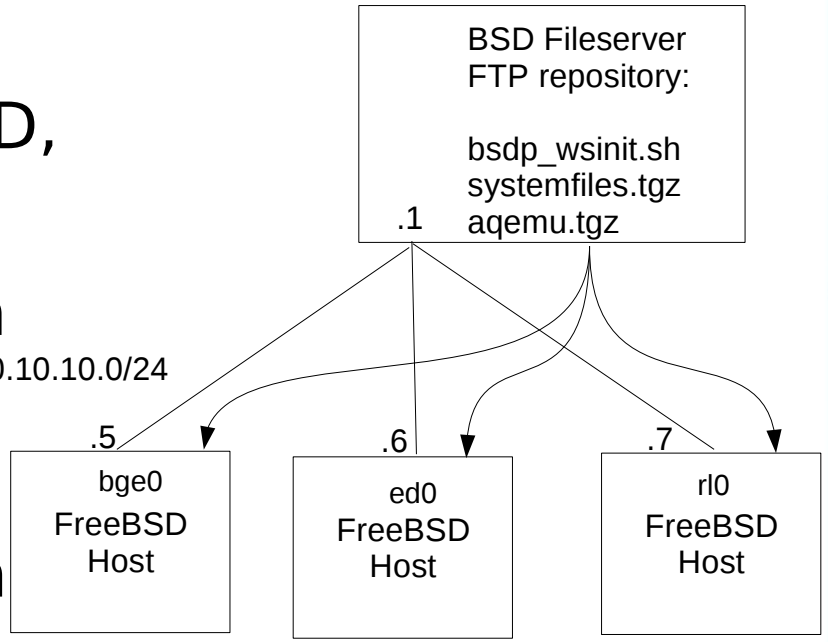
- Package and Pkgsrc repositories live on the Exam Fileserver.
- If the candidate wants to use a package, he/she simply configures the environment to use the repository provided.
- Sizing and maintenance of the fileserver content are a current concern.
- No exam content here.

BSD Fileserver
FTP repository:

pub/
pub/BSDPLabInstall
pub/DragonFlyBSD/...
pub/FreeBSD/...
pub/NetBSD/...
pub/OpenBSD/...

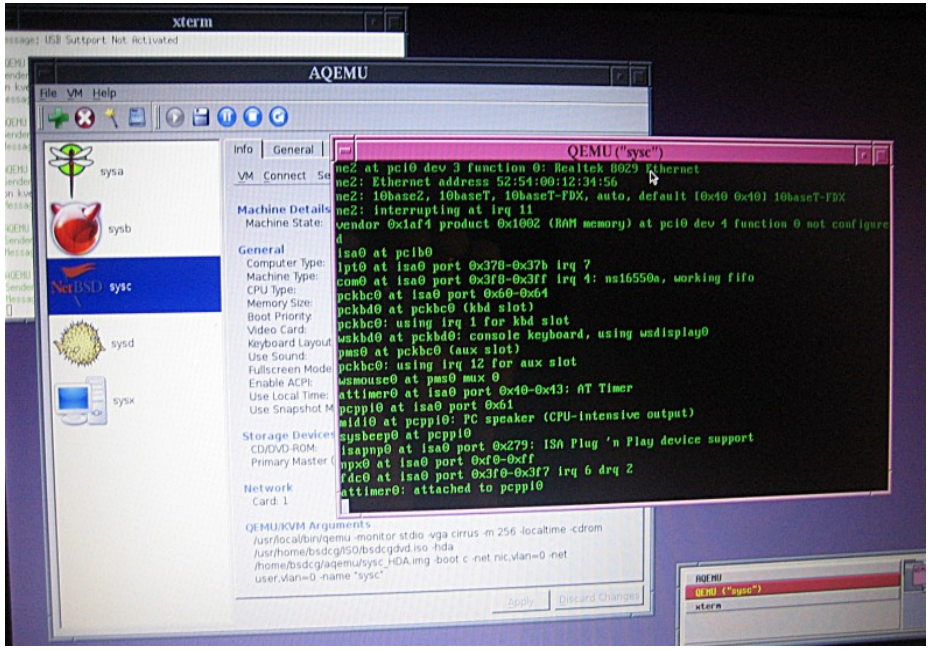
BSDP Lab Workstation Installation

- Installation is via customized install.cfg which loads FreeBSD, and multiple packages.
- *After* the install, a script is run that downloads and overlays the required files for the Lab.
- On a GigE network installation takes about 20 minutes per machine, easily “overlappable”.
- No exam content here (either).



BSDP Lab Interface

- Two basic window managers are available (fvwm or xfce)
- xload and xclock are preinstalled
- One limitation- you *cannot* cut and paste from the Host system to a Guest VM. You *can* cut and paste in the same VM.



BSDP Lab Interface

- Acceptable performance with four or five open windows is possible on commodity laptop hardware.
- Specialized hardware may yield even better performance.

Lab Demo

- Short demo of the lab.
- “Is there a ~~victim~~ volunteer in the audience?”

BSDP Lab Prototype

- Example Scenario:

  “You've just been hired as the senior system administrator for Example Corporation. There has been a major systems disaster and your boss, Mr. Big, demands that you immediately set up three new BSD systems and get the company back into operation in four hours (or else...)”

BSDP Lab Prototype

Mr. Big wants you to perform the following:

1. Install a new BSD development server according to a detailed specification for disk layout and user accounts.
2. Install a second new BSD server, recreate the lost services (DNS, Web, and FTP) according to further detailed specifications.
3. …
4. …
5. …

BSDP Lab Prototype

2.0 DNS Setup

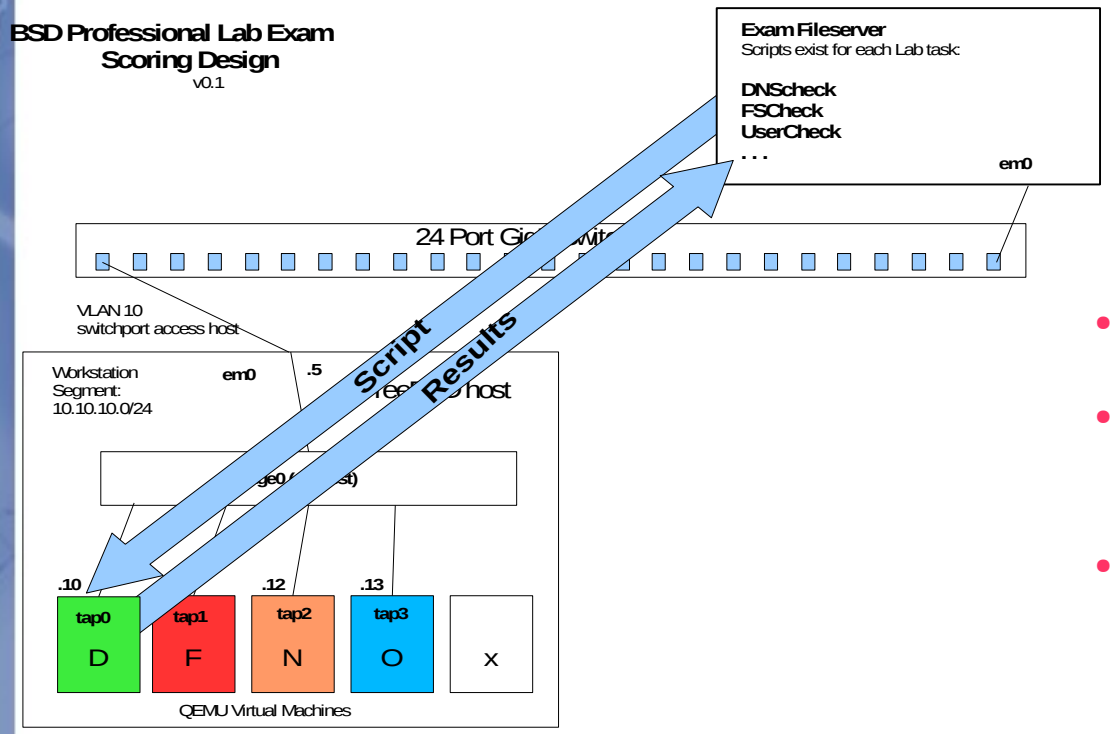
Set up DNS on sysb as follows:

- www.example.net 10.10.10.11
- ns01.example.net 10.10.10.13
- devel.example.net 10.10.10.12
- alias ftp to www
- Make devel.example.net mail server (priority 20)
- DNS is authoritative forward and reverse
- ns01 is master, devel is slave

2.1 ...

2.2 ...

BSDP Scoring Concept



Scoring Execution Concept

- Log into Fileserver
- Perform tests on VM host saving results on Fileserver
- Score results. No scoring takes place on the workstation.

The basic idea is to score the test immediately. A “provisional” result can be given to the candidate upon completion. A full psychometric review by the BSDCG will “officially” score the results and provide domain percentages.

Your Results...

???

BSDCG Directions

- Three directions are on the horizon for the BSDCG:
  - Proctor Network (SMT, PES)
  - New certifications
  - ISO/IEC 17024 accreditation

Proctor Network

- Current BSDA examination delivery is not scalable by the BSDCG. We simply do not have enough resources to cover the globe.
- Proctor networks are companies whose primary business is to provide a proctored exam environment in multiple countries.
- This is how larger exam companies scale up.
- Currently looking closely at SMT. OpEx is roughly $2K / year.
- Will add some cost to the exam price.

SMT Proctor Network

- SMT Proctor Network as of November 2010

New Certification Ideas

- New certifications being discussed:
  - BSD firewall certification (pf, ipfw, and friends)
  - Embedded development
  - Virtualization / Global Enterprise
- Watch the BSDCG website for details.

ISO 17024 and ANSI Accreditation for BSDCG

- Features and Benefits
  - Automatic recognition of the included certifications (and certification group) by the US federal, state, and local governments; and over 80 international organizations
  - Ability to display ANSI and ISO logos within guidelines (validation of program)
  - Wide industry acceptance
  - Ability to enter new markets as a recognized program
  - A much better certification program

ISO 17024 and ANSI Accreditation for BSDCG

- What It Will Take
  - Completion takes about 12-16 months. Have to go through a complete management cycle (usually 12 mo.)
  - Up front cost is about $25,000 (includes application, audits, and some money for remediation)
  - Annual program maintenance (OpEx) is about $5,000 / year (yearly mini-audits are required)

ISO 17024 and ANSI Accreditation for BSDCG

- What It Will Take (cont.)
  - A **lot** of documentation (Fortunately...)
  - Internal individual training on new roles and procedures
  - External audit of finances (past 3 years)
  - Pre-audit (by ANSI auditors)
  - Final audit by ANSI
  - Fix any non-conformities

Getting Involved

- We need **your** help!
  - Question Pool
  - Test Scenarios
  - Test Scripts
  - Lab Improvements
  - Donations ($$$, hardware, software)
  - Beta Testers
  - ISO 17024 workers
  - ... and more!

Announcement

- We will have an BoF session to help determine some additional aspects of the lab exam.
- BoF details:
- We will have the workstations available for your review and comment. Please stop by for a test drive and give us some feedback.

Comments/Questions

Comments

and

Questions?

Contact:

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Thank You!