

## Apricot 2025 – Fellow Report

### **Report Submitted by:**

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**Master Class:** Practical Virtualization with Hybrid Strategies

### **Introduction**

The Apricot 2025 - Master class on Practical Virtualization with Hybrid Strategies was held from February 20 to February 23, 2025 at M World Hotel in Petaling Jaya, Malaysia, which provided a platform for industry professionals to gain hands-on experience and insights into cloud computing, risk management, storage solution and hybrid virtualization strategies. With a focus on technical expertise and collaborative learning, the master class featured expert-led sessions, interactive labs, and in depth discussions. Thus, the event fostered collaboration and knowledge-sharing, empowering attendees to apply innovative virtualization strategies in their respective organizations.

### **Day-wise Activities**

The event was structured into three days of intensive masterclass sessions and a final day dedicated to soft skills development which provided valuable skills essential for professional development. The master class was conducted by four trainers [three from the Network Startup Resource Centre (NSRC) and one from Taiko Solution Dsn Bh.]. The day-wise program is detailed below:

#### **1. Master Class - Day 1 (Feb 20)**

The masterclass began with introductions from both trainees and trainers, where we shared our daily activities at our workplaces and our countries of origin. This was followed by an introductory presentation on cloud services, covering Software as a Service (SaaS) like Office 365 and Google Workspace, Infrastructure as a Service (IaaS), a brief introduction to containers, types of storage such as block storage, network file storage, and object storage, as well as networking. The trainer also briefly touched on the application lifecycle and CI/CD (Continuous Integration/Continuous Deployment). A lab exercise was conducted where we were provided with an admin account and asked to create our own accounts and enable Multi-Factor Authentication (MFA). From that point onward, we were expected to complete practical exercises using our new accounts.

After completing the lab, we delved into cloud security and its guiding principles. Through various case studies, we discussed the mistakes companies had made or overlooked and how those could have been prevented. It was an enriching session on security, highlighting insider threats, outsider threats, and the importance of additional security measures like MFA. The session also emphasized the importance of log management and deactivating user profiles once employees leave the organization.

The final agenda for the first day, which was public cloud management, couldn't be completed as we had a networking social event. As a result, the first day ended with all participants gathering for the networking session.

## **2. Master Class - Day 2 (Feb 21)**

On the second day, we continued with the final agenda from day one, where we discussed why organizations should opt for cloud computing. We explored the services it offers, such as scalability, pay-as-you-use models, and more. The class moved forward with a comparison between different cloud services, providing insights into costing and common mistakes made in cost management. A lab exercise on billing was also conducted to help us understand how the billing and cost management module works on AWS.

After wrapping up the day one topics, we moved on to containerized application deployment. We explored Docker and had a hands-on lab exercise on installing Docker from scratch on one of the instances we created on AWS. The lab focused on installing Zabbix from Docker, familiarizing us with Docker files and their environment. Further, the concept of Infrastructure as Code (IAC) was introduced. This was a new and enlightening topic for me, and it was fascinating to see how it simplifies infrastructure management, using Terraform as an example. The trainers guided us through the functionality of Terraform, providing practical insights and highlighted the differences between ansible and terraform.

The class then focused on virtualization, where the trainers explained the concept using the example of disk partitioning on our laptops. We also discussed the benefits of virtualization and the differences between Virtual Machines (VMs) and containers. Lab exercises were conducted alongside these discussions to enhance our understanding, including a detailed demonstration of logical volumes to make understand about Linux storage systems. We explored popular hypervisors such as VMware Workstation and Oracle VirtualBox. The highlight of the second day was Proxmox, an open-source virtualization manager used for managing virtual machines within an organization. The trainers explained the reasons for choosing Proxmox and engaged us in exercises involving Proxmox clusters and its user interface, helping us become familiar with its features. Through hands-on activities like creating VMs and containers in Proxmox manually, we gained practical experience. Additionally, we were introduced to the concept of templates, which facilitate the efficient creation of VMs and containers, especially in large-scale deployments.

Towards the end of the day, we discussed RAID concepts and the differences between various RAID levels, emphasizing that configuring RAID is not the same as keeping a backup of one's data.

## **3. Master Class - Day 3 (Feb 22)**

The final day of the masterclass continued with the concept of storage, where the Ceph technology was introduced as a feature in Proxmox. We also familiarized ourselves with several commands related to Ceph, marking the completion of the virtualization segment. The first two days of the masterclass focused on hosting services, either on the cloud (with an example of AWS) or on-premises through server virtualization platforms such as Proxmox and VMware. Both methods are

used for hosting virtual machines within organizations. However, utilizing such technologies requires significant CPU, RAM, and storage resources. Therefore, monitoring these resources and network traffic after implementation is equally crucial. Towards the end of the masterclass, we learned about implementing the right strategy and using monitoring tools to oversee organizational infrastructure.

We also discussed SNMP, a traditional monitoring technology, and tools like LibreNMS, which was popular among fellow attendees. The trainers introduced us to Prometheus, a more dynamic monitoring software with advanced metrics features. Through lab exercises, we set up Prometheus in Proxmox and exported metrics using Grafana from various sources, gaining visibility into the health and performance of our infrastructure. At the end of the session, a completion certificate was awarded to all attendees.

#### **4. Skill Workshop - Day 4 (Feb 23)**

The fourth day was a bonus class focused on soft skills development for fellows. While Technical knowledge is essential for all the attendees, posing soft skill is vital as well. Thus, the last class was all about building one's confidence and acquiring the insight on how to present oneself and sell ideas effectively. It was a long day filled with fun activities on learning public speaking, presentation skills and we also learnt about different types of leadership. We were divided into groups and were made to work on spontaneous presentation, speak as a team on the props and cue card provided. The session was very interactive which made us mingle more with other fellows and truly experience the essence of networking and socializing.

### **Conclusion**

Apricot 2025 was indeed a remarkable opportunity, not only as a source of ideas and knowledge but also as a platform for interacting with people from diverse backgrounds and walks of life. It felt like a Human BGP event, where the connections and experiences were just as valuable as the technical insights gained. The expertise and exposure I received will be instrumental for my organization, especially as we also use Proxmox for virtualization. For instance, I am currently using Proxmox alongside Ceph. However, my Ceph setup was not functioning as expected, and despite my efforts, I couldn't resolve the issue. During the masterclass session, I had the opportunity to clear my doubts and understand the root cause of the problem with the help of my trainers, who responded promptly and guided me towards a solution. This hands-on troubleshooting experience not only resolved my immediate technical challenges but also deepened my understanding of Ceph and proxmox best practices, which I can now apply to future deployments and troubleshooting.

The event also provided fresh insights into some useful open-source tools and how to use these software effectively. With this newfound knowledge, I can assist my sister companies in adopting Proxmox's virtualization solutions to address their budgetary concerns. This will contribute to achieving my organization's goal of becoming the Centre of ICT Excellence for the Druk Holding and Investments Group of Companies.

Furthermore, I gained hands-on experience with AWS, a widely-used cloud platform. Although I had attended a few AWS training sessions before, I had never fully experienced its functionality. This exposure

will enable me to better explain the advantages and features of cloud solutions to my management, should the need arise in the future.

Finally, the friendships I forged during the event have created a valuable support network for future collaborations. This network will help me to tackle challenges more effectively and seek guidance as needed fostering continued growth and progress.