

LEARN NOC Meeting, 2023



UNIVERSITY OF VAVUNIYA,

14.12.2023

K.Pratheepan
System Engineer Gr.I

Outline

- UOV - University of Vavuniya
- UOV NOC Hardware Resources
- UOV NOC Human Resources
- UOV NOC on Premise Services
- UOV NOC on Cloud Services
- UOV Network Infrastructure
- Network Related Issues
- Future Development Plan



University of Vavuniya

- Vavuniya Campus of the University of Jaffna was established in 1997.
- Elevated to a Separate State University as University of Vavuniya in 2020..
- After this migration we had to separate each and every domain names, server configurations from `vau.jfn.ac.lk`. to `vau.ac.lk`,
 - 1.We had separate web servers on both domains
 - 2.We had separate IAM servers on both domains then removed previous domain
 - 3.We had both IRS Servers then removed previous domain.
 - 4.We have G-Suite in both domains



UOV NOC Hardware Resources

- NOC Located at DPS (Resources are shared with ITC)
- LEARN SLT Link @ 500Mbps
- LEARN Dialog Backup Link @ 100Mbps
- Physical Servers in use – 12
- Firewall on Pfsense (DMZ, VPN, VLAN & Bandwidth Control....)
- Core Switch HPE Flexnetworks 5510 -02



UOV NOC Hardware Resources Continue....

- L2 Manageable Switches as Distribution & Access Switch – 42.
(Cisco, HP, Juniper, Aruba...)
- We are connected basic access switches in UOV network -25 (D-Links, TP-Links...)
- Wireless Controller on Cloud – Cambium
- Wireless Access Points - Cambium 43, Aruba 12
- Power Sources
 1. 10KW APC SMART UPS – 01
 2. 6KW APC SMART UPS – 01
 3. 3KW EATON UPS - 06
 4. Auto Power Generator – 01



UOV NOC Human Resources

- Head - Physical Science -01
- Director - IT Centre -01
- System Engineer -01
- System Analyst -01
- Assistant Network Manager -01 (On Vacant)
- Technical Officers -02 (On Call)
- Attendant -01 (On Call)



UOV NOC on Premise Services

- Pfsense Firewall for Internet Services, VPN, DMZ & VLAN Controlling
- Web Services on Containers (VAU, FAS, FBS, FTS, Apps)
- VLE Services (VAU, FAS)
- VLAN Services
- Open LDAP for Zoom & EDUROAM Services
- AD Services for Student's Local Login
- IDP for Zoom Services



UOV NOC on Premise Services Continue

- EDUROAM Services
- Koha Library Management System Services
- Digital Resource Repository on DPACE
- MIS Services
- Payment Gateway Services
- Wi-Fi Coverage to Entire University Premises



UOV NOC on Cloud Service

- Cambium Wireless Cloud Controller
- G-Suite Account to Staff & Students for e-mail, G-Drive, Calendar, ClassRooms....
- Microsoft Dreams Park Account (vau.jfn.ac.lk Subscriptions Expired)
- Microsoft Account to Staff & Students on vau.jfn.ac.lk domain name
- Microsoft Account to Staff & Students on ms.vau.ac.lk domain (Under Review)



Access Restrictions on pfsense Firewall

- Only Certain Ports and Services are allowed with in VLAN
- MGT VLAN has access to all VLAN but other VLAN has no
- VPN users only allowed to login pfsense and servers in DMZ



VLAN Controlled in pfsense

pfSense COMMUNITY EDITION

System ▾ Interfaces ▾ Firewall ▾ Services ▾ VPN ▾ Status ▾ Diagnostics ▾ Help ▾ 🔔 3 🔗

Firewall / Rules / WAN 📊 📄 ?


Floating FAS_VLAN_Group **WAN** MGT DMZ FAS FBS FTS PHY_CLI PHY_CLII PHY_AHEAD BIO TECH_LAB

ACL STAFF_ACADEMIC STAFF_GENERAL STUDENTS MGT_TEAM EDUROAM LIB_DELT ITC_OLD ITC PARK_RD

FBS_SMART OpenVPN

Rules (Drag to Change Order)

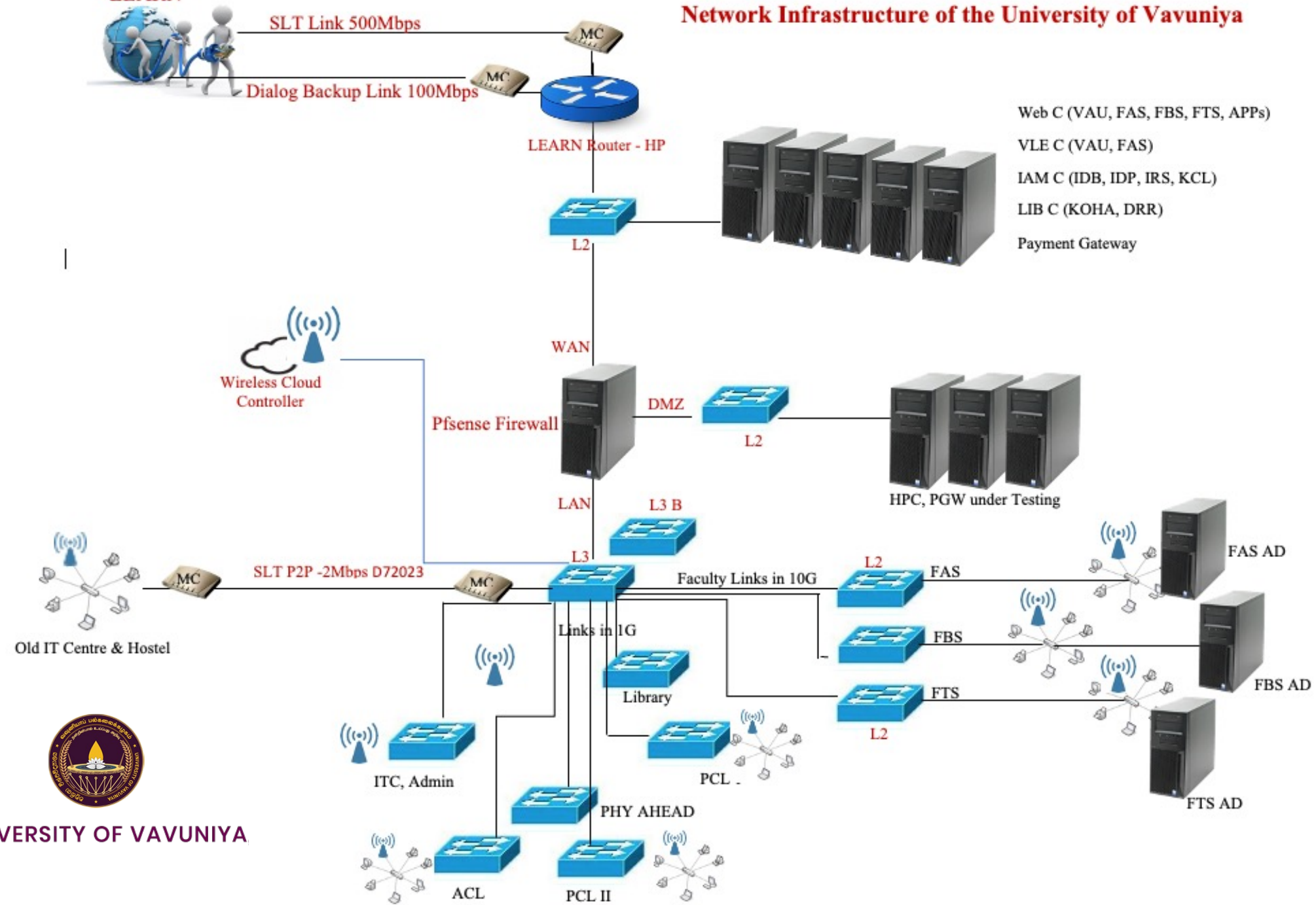
<input type="checkbox"/>	States	Protocol	Source	Port	Destination	Port	Gateway	Queue	Schedule	Description	Actions
<input type="checkbox"/>	✓ 1 / 924.87 MiB	IPv4 UDP	*	*	WAN address	1194 (OpenVPN)	*	none		OpenVPN System Engineer VPN wizard	
<input type="checkbox"/>	✓ 0 / 0 B	IPv4 UDP	*	*	WAN address	1195	*	none		OpenVPN Santhanakrishnan VPN wizard	
<input type="checkbox"/>	✓ 12 KiB	IPv4 TCP	*	*	LMS_Server_Private	443 (HTTPS)	*	none		NAT LMS Server NAT	

 📶 Add ⬇️ Add 🗑️ Delete 💾 Save ➕ Separator

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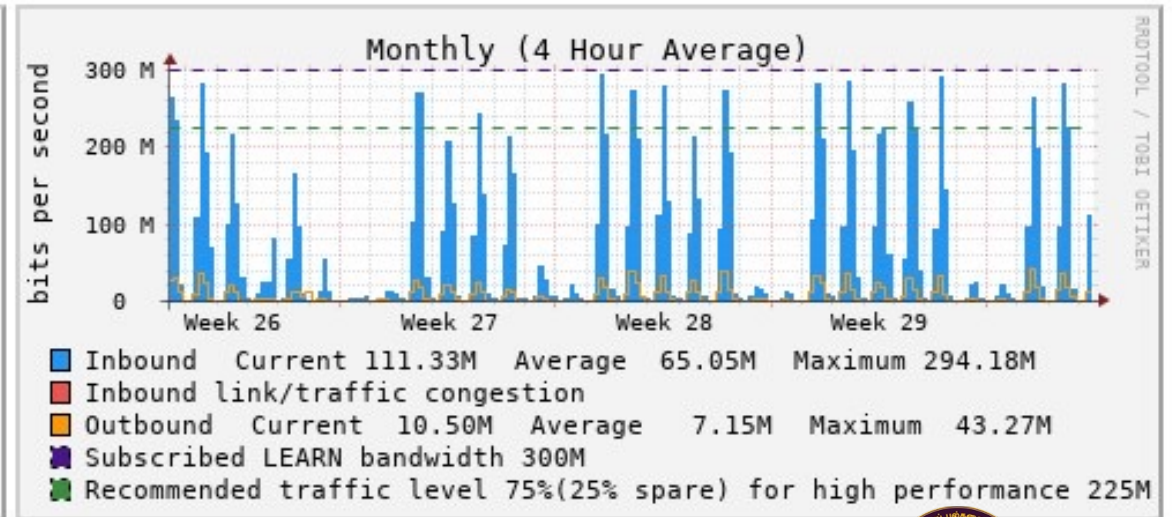
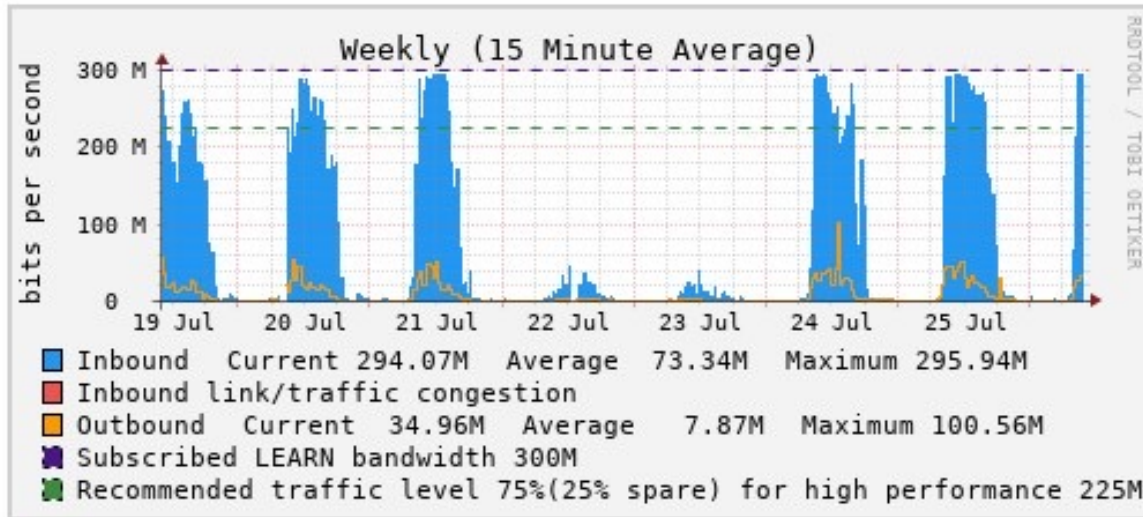
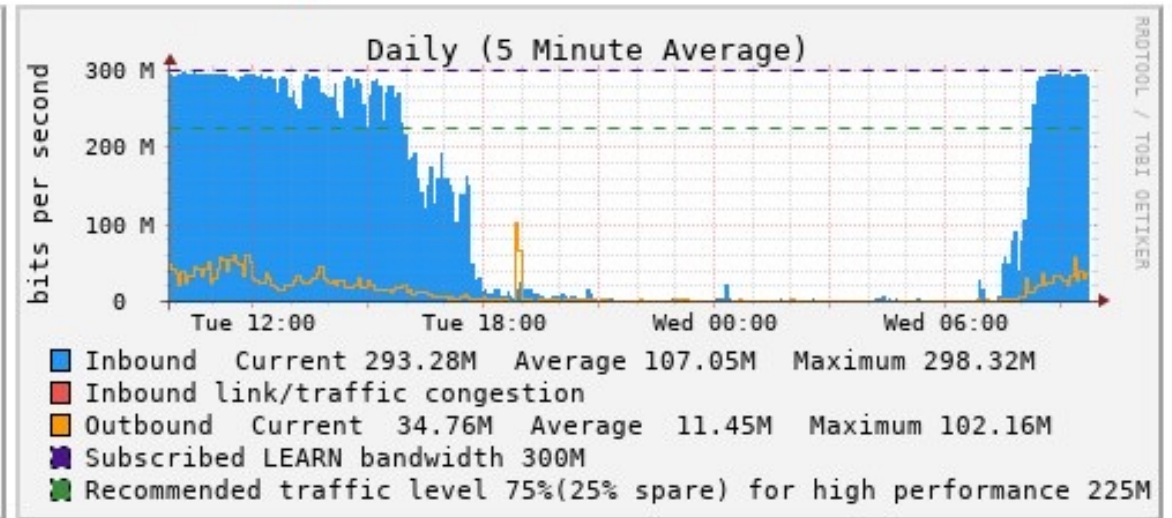
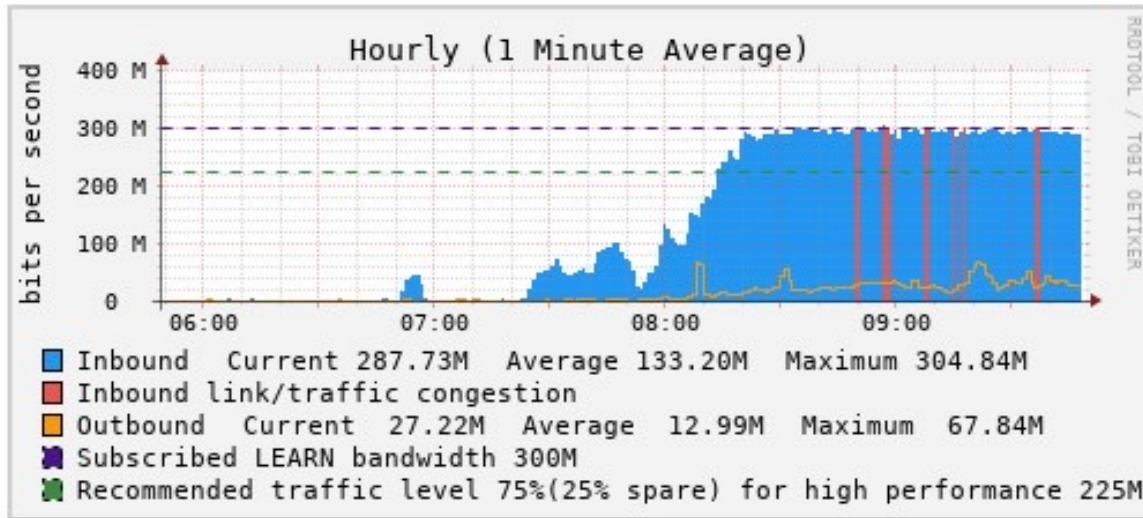
LEARN

Network Infrastructure of the University of Vavuniya



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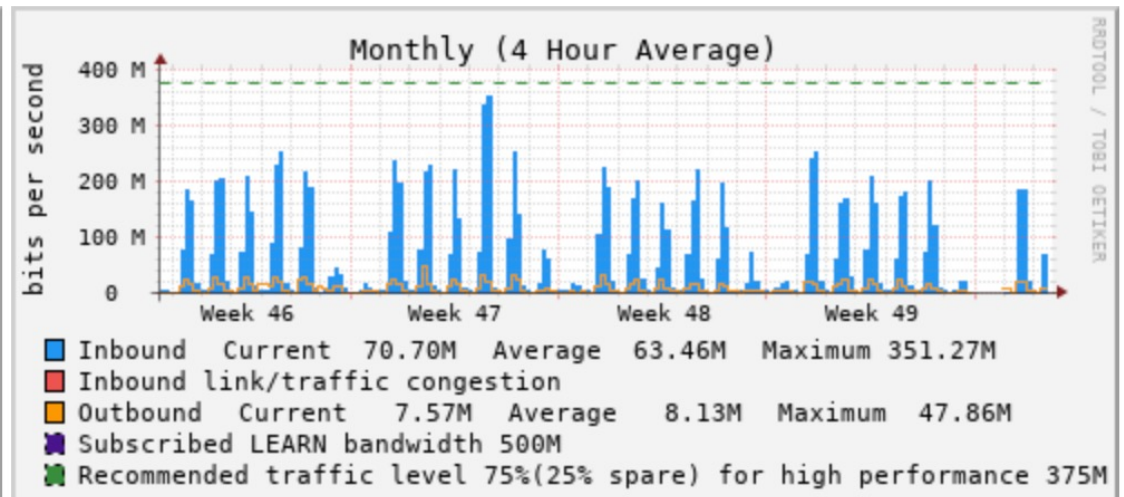
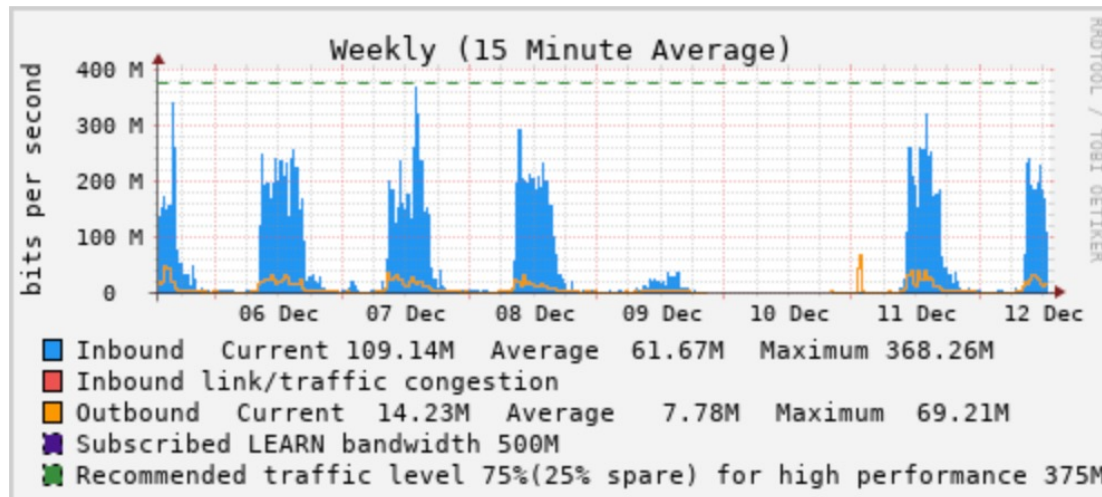
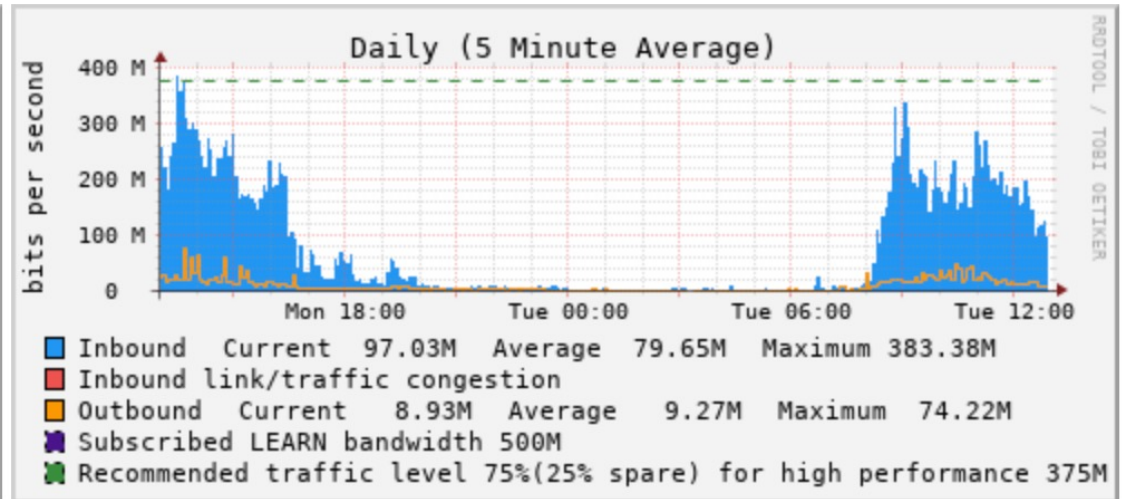
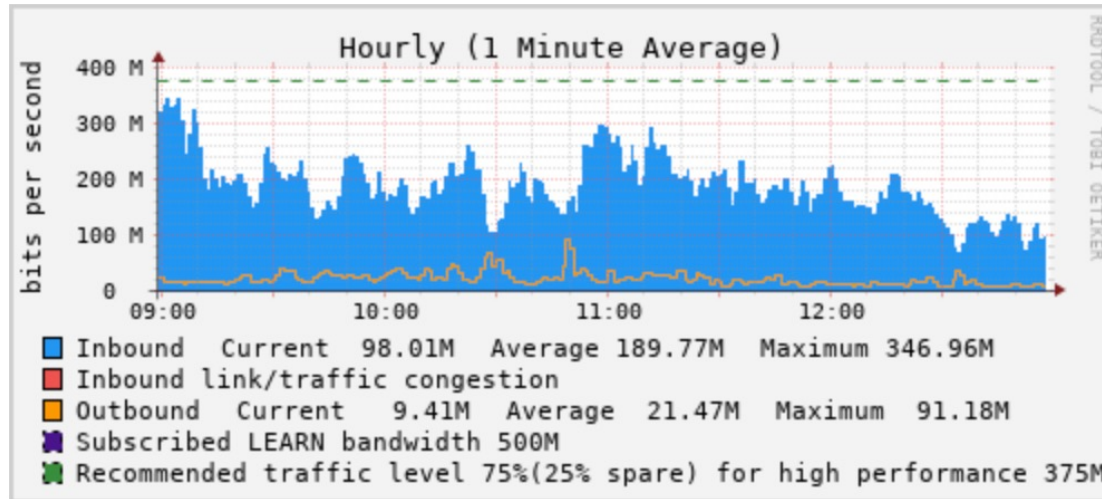
University of Vavuniya



Bandwidth was 300Mbps in Nov,2023



University of Vavuniya



Upgraded Bandwidth 500Mbps in Dec, 2023



Cambium Wireless Cloud Controller



Welcome, K. Pratheepan (Super Administrator)



Devices

42

Total

4

Offline

0

Onboarding

Devices By Type

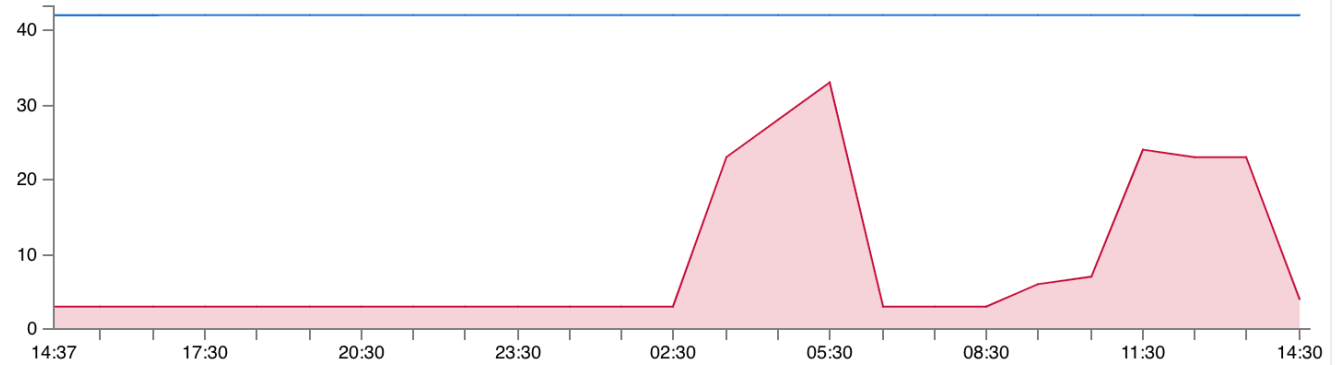
Total: 42

Enterprise Wi-Fi



Connection Health

Period: Last 24 Hours, Resolution: 1 Hour



● Total Devices ● Offline

Alarms

Period: Last 24 Hours

0

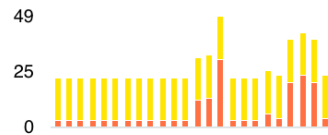
CRITICAL

4

MAJOR

19

MINOR



Threats and Vulnerabilities

Period: Last 7 Days

Threats

0

Unique Vulnerabilities

0

- Critical 0
- Major 0
- Minor 0

Top Networks

Period: Last 5 Minutes

Name

Total

Down

Devices By Type

Alarms

default

42

4



42

● Enterprise Wi-Fi



Cambium Wireless Cloud Controller

Cambium Networks | cnMaestro™

K. Pratheepan MOHE_VAVNIYA

Devices


APs Switches NSEs

Search

Delete Move Export iii

Device	MAC	Status	Onboarding Status	Serial Number	IPv4 Address	IPv6 Address	Type	Configuration...
<input type="checkbox"/> AD-COM-LAB-01	58:C1:7A:D2:5A:78	● Online (0d 9h 57m)	Onboarded (1474d 15h 1...	W8VE019WZF23	192.168.99.242	N/A	cnPilot e600	VAVNIYA Indoor
<input type="checkbox"/> AD-COM-LAB-02	58:C1:7A:D2:9E:7E	● Online (0d 9h 57m)	Onboarded (1474d 15h 3...	W8VE01SKBLFW	192.168.99.243	N/A	cnPilot e600	VAVNIYA Indoor
<input type="checkbox"/> BC-BLOCK-01	58:C1:7A:D2:5B:54	● Online (0d 2h 7m)	Onboarded (1474d 16h 11...	W8VE01FF6HMT	192.168.99.209	N/A	cnPilot e600	VAVNIYA Indoor
<input type="checkbox"/> BC-BLOCK-02	58:C1:7A:D2:9F:CC	● Online (0d 2h 7m)	Onboarded (1474d 16h 4...	W8VE01YYGC21	192.168.99.210	N/A	cnPilot e600	VAVNIYA Indoor
<input type="checkbox"/> BC-BLOCK-03	58:C1:7A:D2:5D:54	● Online (0d 2h 7m)	Onboarded (1474d 16h 0...	W8VE01PPX06D	192.168.99.211	N/A	cnPilot e600	VAVNIYA Indoor
<input type="checkbox"/> BC-BLOCK-04	58:C1:7A:D2:5A:82	● Online (0d 2h 7m)	Onboarded (1474d 15h 4...	W8VE01B1B547	192.168.99.212	N/A	cnPilot e600	VAVNIYA Indoor
<input type="checkbox"/> BC-BLOCK-05	58:C1:7A:D2:5C:52	● Online (0d 2h 7m)	Onboarded (1474d 15h 4...	W8VE01KJ5PG4	192.168.99.213	N/A	cnPilot e600	VAVNIYA Indoor
<input type="checkbox"/> BC-BLOCK-Out	58:C1:7A:8E:4C:8C	● Online (0d 2h 7m)	Onboarded (1474d 18h 3...	W8UE0GYL6XJ0	192.168.99.215	N/A	cnPilot e600	VAVNIYA Indoor
<input type="checkbox"/> BS-LAB-01	58:C1:7A:D2:5B:58	● Online (1d 21h 58m)	Onboarded (1474d 15h 3...	W8VE01FH9L1R	192.168.99.231	N/A	cnPilot e600	VAVNIYA Indoor
<input type="checkbox"/> BS-LAB-02	58:C1:7A:D2:A0:14	● Online (1d 21h 59m)	Onboarded (1474d 14h 5...	W8VE02035MFF	192.168.99.232	N/A	cnPilot e600	VAVNIYA Indoor

Showing 1 - 10 Total: 42 10 < Previous 1 2 3 4 5 Next >



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Cambium Wireless Cloud Controller

Cambium Networks | cnMaestro™

Search | Notifications (4) | Alerts (3) | K. Pratheepan MOHE_VAVUNIYA

Devices > MSR-01

Last updated: < 1m ago

Dashboard | Notifications | Configuration | Details | Performance | Software Update | Tools | Clients | Mesh Peers | WLANs

Status

Online

1d 5h 25m

Offline Last Week

1d 22h 1m

Uptime

Clients

58

234 Unique Clients In Last 24 Hours

Throughput

15.3 Mbps

2 Mbps

Downlink

Uplink

Alarms

Period: Last 24 Hours

0 Critical

0 Major

0 Minor

Stacked Clients by Radio

Resolution: 1 Hour

50

0

06 Dec 07 Dec 08 Dec 09 Dec 10 Dec 11 Dec 12 Dec

Radio 1 Radio 2

Details


Product Name	cnPilot e600
MAC Address	58:C1:7A:D2:5B:1E
IPv4 Address	192.168.99.227
Software Version	3.11.4.1-r3
AP Group	VAVNIYA Indoor
Sync Status	In Sync
Serial Number	W8VE01DK7GMK
Description	

Throughput

Resolution: 1 Hour

32.77

16.38



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UOV NOC



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Network Related Issues in UOV

- Pfsense firewall is able to configure & usable as per our requirements but most of the times it will corrupt & interrupt entire services
- Juniper L2 manageable switches has software corruption during the uninformed power cut in country because NOC only has proper power backups.
- Not enough L2 manageable Switches in Access Level because we are connected with basic switches,



Future Plan

- Need to expand fibre P2P links & wireless network to new buildings
- Redundency System need to be implemented mainly on pfsense and other services
- Intercom System with IP Phone
- NVR based CCTV System to entire UOV
- End level basic access switches need to be replaced by L2 Manageable Switch



Thank you



வவுனியாப் பல்கலைக்கழகம், இலங்கை
වවුනියා විශ්වවිද්‍යාලය, ශ්‍රී ලංකාව
UNIVERSITY OF VAVUNIYA, SRI LANKA