

NREN update

NREN: HARNET Country: HKSAR China Presenter: Gerrit Balman

The 3rd Asi@Connect Project Meeting/ March 26 2018 Matrix Building, Biopolis, Singapore





NREN : HARNET (Hong Kong Academic and Research Network)



- Number of member institutions : 16 (10 connected to HARNET)
- Backbone : Multiple 10G with 2 x Optical DWDM Rings





Network update

- Network connection (National) :
 - ✤ Optical Network upgraded to 2 x DWDM Rings with Multiple 10Gs
- Network connection (International) :
 - Commodity Internet 5.6Gbps -> 8Gbps,
 - ✤ TEIN 120M -> 1G
- DDoS Mitigation Services Subscription experience sharing
- ✤ HARNET R&E Node





Network update - from single DWDM node

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TEIN



Asi@Connect

Network update – to dual DWDM nodes with 2 x DWDM Rings





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Activity update - DDoS Mitigation Services

DDoS+ Solution to JUCC

- Monitor & detect DDoS attacks over 2000+ Class C
 Networks across HARNET & 8 Universities
- Concurrent mitigation & protection for 16x Class C
- 1000Mbps clean bandwidth
- 5x websites protection for each University member
- 2x zones protection for each University member





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Activity update - DDoS Mitigation Services

Volumetric Attack (77%) TCP Flood (11%) HTTP / HTTPS Flood (37%) DNS Flood / Amplification (3%) UDP Flood (1.5%)

JUCC Attack Alerts (12/2016 to 09/2017)

Figure 1. Attack types breakdown for JUCC between 12/2016 and 09/2017.

[Volume	TCP Flood	HTTP/S Flood	DNS Flood	UDP Flood	ICMP Flood	NTP Amp
	800	117	62	34	15	7	1

Table 1. Total alerts (including informative) reported for JUCC between 12/2016 and 09/2017.

Attack Volume (12/2016 to 09/2017)



Figure 2. Volume (Mbps/Gbps).

Less than 250Mbps	250Mbps ~ 1 Gbps	Exceed 1Gbps
20	82	14

Table 2. Volume (Mbps/Gbps) based on high alerts (excluding informative alerts).





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Activity update - DDoS Mitigation Services

Packet Per Second (12/2016 to 09/2017)

Duration (12/2016 to 09/2017)



Figure 3. Packet Rate (kpps).

Figure 4. Duration (minutes)

Less than 25kpps	25kpps ~ 100kpps	Exceed than 100kpps
17	65	34

Table 3. Packet rate (kpps) based on high alerts (excluding informative).



Less than 5 minute	Between 5 and 10 minute	More than 10 minute	
34	39	43	

Table 4. Duration (minute) based on high alerts (excluding informative).



Activity update - New R&E Node





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Activity update - New R&E Node Schedule





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