

# IETF Hackathon Report: DOTS Interop

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IETF 101 DOTS WG  
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# DOTS Hackathon Plan

- Test the interoperability between independent implementations:
  - See the maturity of these core specs of DOTS protocol
    - draft-ietf-dots-signal-channel-17
    - draft-ietf-dots-data-channel-13
- Implementations
  - OSS by NTT: nttdots: <https://github.com/nttdots/go-dots>
  - Proprietary implementation of NCC Group
  - Proprietary implementation of Arbor (couldn't attend this time)
  - Proprietary implementation of Huawei based on nttdots

# DOTS Hackathon Achieved

draft version: draft-ietf-dots-signal-channel-17 or later					
<a href="https://datatracker.ietf.org/doc/draft-ietf-dots-signal-channel/">https://datatracker.ietf.org/doc/draft-ietf-dots-signal-channel/</a>					
Purpose: Check interoperability of the messages on the signal channel					
<b># DOTS Signal Channel Features implementation status</b>					
#	feature	ncc*	nttdots*	huawei	arbor
1	Session Configuration	✓	✓		
2	Mitigation Request	✓	✓		
3	CoAP Ping	✓	✓		
4	observe	✓			
5	efficacy update	✓			
6	request confliction handling	✓			
7	confliction notify				
8	deadman's trigger				
9	gateway function	✓			
10	redirection				
11	happy eyeballs	✓			
* supporting both PKI and PSK					
<b># DOTS Data Channel Features implementation status</b>					
#	feature	ncc	nttdots	huawei	arbor
1	Register DOTS clients				
2	Register Alias	✓			
3	Register Filtering Rules	✓			
<b># Interoperability Testing Results</b>					
1. Session Configuration		DOTS Server			
		ncc	nttdots	huawei	arbor
DOTS Client	ncc	✓	✓		
	go-dots(ntt)	✓	✓		
	huawei				
	arbor				
2. Mitigation Request		DOTS Server			
		ncc	nttdots	huawei	arbor
DOTS Client	ncc	✓ *	✓ *		
	go-dots(ntt)	✓ *	✓ *		
	huawei				
	arbor				
* supporting mid/cuid in URI-Path(the latest spec)					
3. CoAP Ping		DOTS Server			
		ncc	nttdots	huawei	arbor
DOTS Client	ncc	✓	✓		
	go-dots(ntt)	✓	✓		
	huawei				
	arbor				

# Features and implementation status

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# Interoperability Testing Results

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		ncc	nttdots	huawei
DOTS Client	ncc	✓ *	✓ *	
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	huawei			
	arbor			
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DOTS Client	ncc	✓	✓	
	go-dots(ntt)	✓	✓	
	huawei			
	arbor			

# We are getting there!

- DOTS (DDoS Open Threat Signaling) protocol
  - Makes Distributed Denial of Service (DDoS) Protection more effective with its programmatic capability.
  - Protects the Internet from DDoS attacks.
- We confirmed that we can do cooperative DDoS Protection operations between (at least 2) independent implementations

# Example Protection of IP

- Successful Mitigation Request from OSS DOTS client (nttdots) to proprietary DOTS server (NCC Group) – and vice versa.

The screenshot displays the 'Mitigations Info - Appliance' section of the nccgroup DDoS Secure interface. The main table lists two mitigation entries:

	State	Destination IP	Portal	Requester	Thresholds				Requesting device(s)				Mitigation	
					Pkts/s		Bits/s		Pkts/s		Bits/s		Pkts/s	
					Lower	Upper	Lower	Upper	Current	Peak	Current	Peak	Current	Peak
1	Active	1.1.2.201	ex-portal1	13.115.156.186	0	0	0	0	0	0	0	0	0	0
2	Configured-Active	1.1.1.69	ex-portal1	192.168.191.2	0	0	0	0	0	0	0	0	0	0

On the right side of the interface, the status is 'DEFENDING STANDALONE' with a '[Demo Replay]' button. Below this, the 'Appliance' statistics are shown:

- Inb'd: 2.282M Bits/s
- Outb'd: 3.635M Bits/s
- Inb'd: 3.214k Pkts/s
- Outb'd: 759 Pkts/s

The 'Blocked Protocol' option is selected in the bottom right corner.

# What we learned

- We can meet the expectations for DOTS protocol from the market soon
  - Draft Signal Channel spec is almost stable
- In the Hackathon, we tested based on proposing spec (to be included in the coming -18 draft), so it is proven to work!
- Discussed and clarified a lot about the current drafts text
- Discussed adding new feature on the protocol, which could be included in the DOTS spec in future



# Achievements in detail (for WG)

## **Achievement 1. During the Hackathon**

Successfully worked interoperable features

- CRUD operations on session configuration and mitigation request
- gateway function (on NCC Group side)
  - Nttdots client traffic to NCC Group DOTS Gateway relayed to nttdots server + cdid addition
  - the usage of "cdid" is now under discussion
- PKI and PSK mode on DTLS
- cuid/mid in URI-path: it helps an implementation using libcoap

# Achievements in detail (for WG)

## **Achievement 2. In preparation for the Hackathon**

Actually nttdots and NCC Group did interop tests internally 3 times! before the Hackathon

- Agreed on trying with the latest spec (-17 or later)
  - Updated models so as to comply with that
- Added CoAP ping capability (nttdots)
- Many fixes of the code on both side

# Wrap Up

Team members:

Kaname Nishizuka (NTTCom)

Jon Shallow (NCC Group)

Liang 'Frank' Xia (Huawei)

First timers @ IETF/Hackathon:

Nagata Takahiko (Lepidum)

Dong Yue (Huawei)

Thank You!