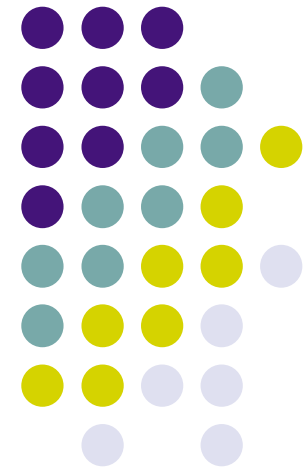


# Unified L2 Abstractions for L3-Driven Fast Handover

draft-irtf-mobopts-l2-abstractions-01

F. Teraoka, K. Gogo, K. Mitsuya, R. Shibui, K. Mitani  
Keio University



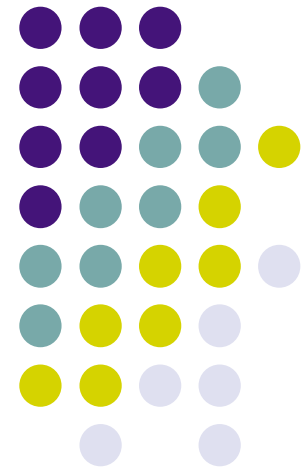


# ToC

- Gap Analysis against IEEE 802.21
- WG Feedbacks
  - from Christian Vogt and Jukka MJ Manner
  - Thank you!
- Questions to WG

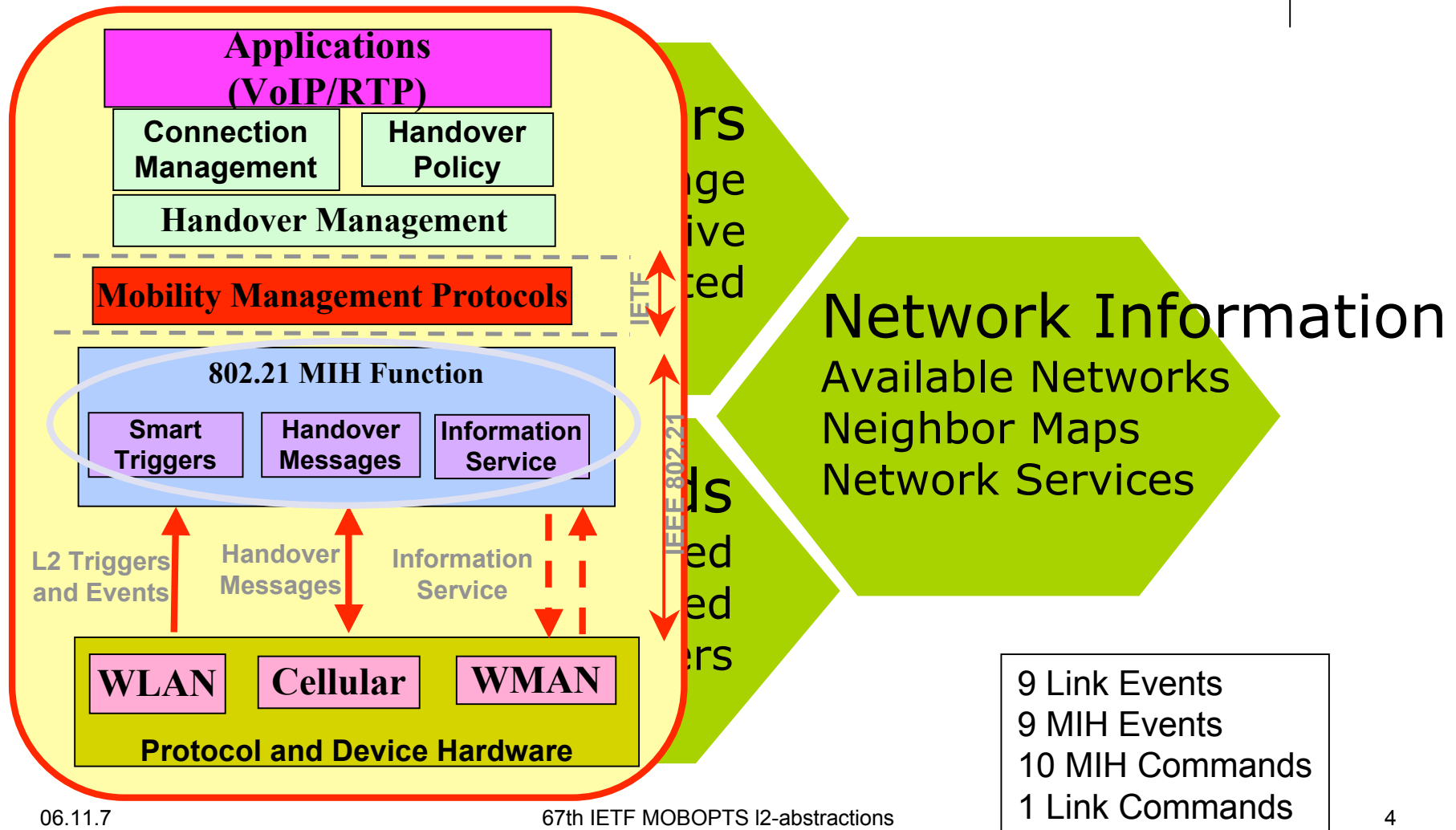
# Gap Analysis against IEEE 802.21

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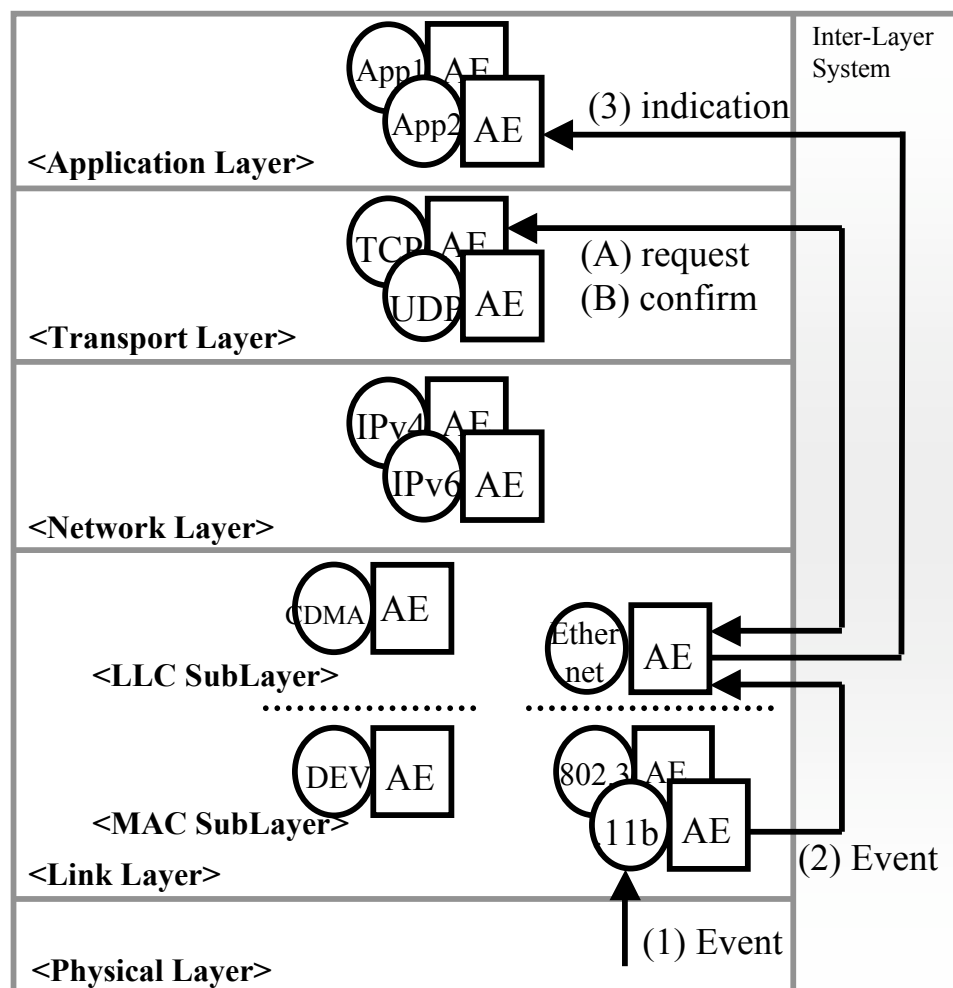


# 802.21: Key Services





# L2-abstractions: Overview



- A part of an inter-layer information exchange
  - L2 Information Services
  - L2 Triggers
  - L2 Commands
- Not only between L2 and L3 but also between any layers
  - This is why protocol layer id is defined
- focus on information only inside MN
- 9 primitives are defined

AE Abstract Entity  
PE Protocol Entity



# Primitive Mapping

L2-abst		802.21		Description
Type	Primitive	Event type	Event name	
1	L2-LinkStatus	MIH Commands	MIH Get Status	Get the status of links
1	L2-PeerList			Get a list of the candidate PoAs
2	L2-PeerFound	MIH Events (State Change)	MIH Link Detected	New PoAs are detected
2	L2-PeerLost			A candidate PoA disappears
2	L2-LinkUp	MIH Events (State Change)	MIH Link Up	L2 Connection established
2	L2-LinkDown	MIH Events (State Change)	MIH Link Down	L2 Connection is broken
2	L2-LinkGoingDown	MIH Events (Predictive)	MIH Link Going Down (*1)	L2 connection breakdown imminent
3	L2-LinkConnect	MIH Commands	MIH Switch	Switch the links as specified
3	L2-LinkDisconnect	MIH Commands	MIH Handover Commit	Request to establish a new link to the specific PoA

(\*1) 802.21 does not performs an anticipatory indication e.g. LinkGoingDown

# 802.21 Services Not Defined in L2-abst



## MIH Events

No	Event Type	Event Name	Description
4	State Change	Link Detected	New L2 link has been found
5	State Change	Link Parameters Change	Change in specific link parameters has crossed pre-specified thresholds (link Speed, Quality metrics)
6	Administrative	Link Event Rollback	Event rollback
7	Link Transmission	Link SDU Transmit Status	Improve handover performance through local feedback as opposed to waiting for end-to-end notifications
8	Link Synchronous	Link Handover Imminent	L2 intra-technology handover imminent (subnet change). Notify Handover information without change in link state.
9	Link Synchronous	Link Handover Complete	Notify handover state

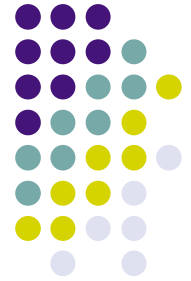
# 802.21 Services Not Defined in L2-abst (cont.)



## MIH Commands

No	Command Name	Description
3	MIH Configure	Configure a link
4	MIH Configure Threshold	Configures thresholds for link events
5	MIH Scan	Scan a link
6	MIH Handover Initiate	Network initiates handover and sends a list of suggested networks and associated PoA
7	MIH Handover Prepare	This command is sent by current MIHF entity to target MIHF entity to allow for resource query and handover preparation.
9	MIH Handover Complete	Notification from new serving MIHF to previous serving MIHF indicating handover completion, and any pending packets may now be forwarded to the new MIHF.
10	MIH Network Address Information	Sent from current serving MIHF entity to target MIHF entity to obtain reconfigured network address on target network for the client.



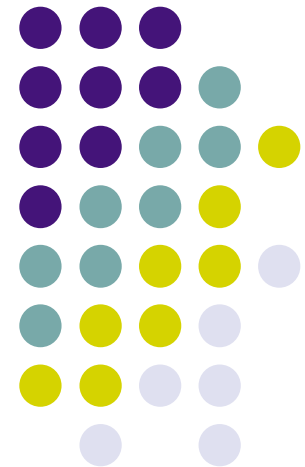


# Gap Analysis against P802.21

- Architectural Differences
  - 802.21 defines an MIH function as a shim layer between L2 and L3
  - L2-abst does **NOT use an intermediate shim layer** between L2 and L3. It is a part of an inter-layer information exchange
  - L2-abst exchanges information between any layers
  - L2-abst requires modifications only to the mobile node
- Types of Services
  - L2-abst provides:
    - Link Layer Triggers (= primitive type 2)
    - Handover Commands (= primitive type 3)
    - Information Service (primitive type 1)
  - L2-abst does **NOT provide:**
    - **Network Information Services**
  - 802.21 offers more services (20+ v.s. 9)

# WG Feedbacks

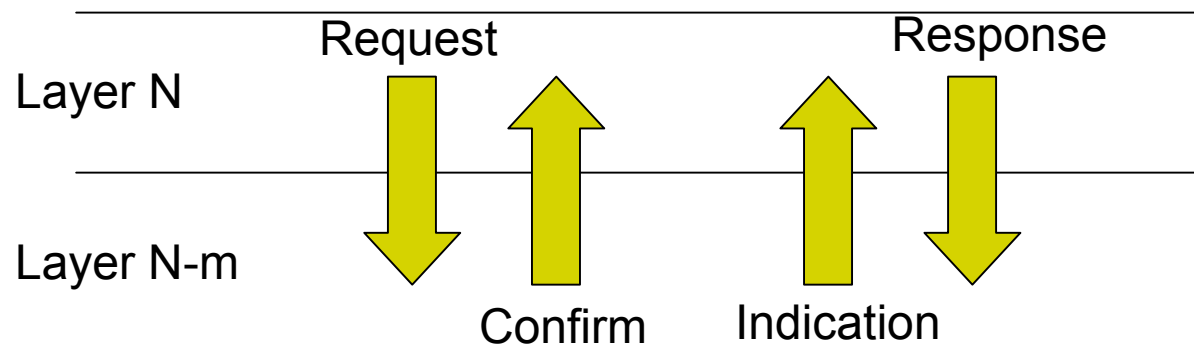
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# Figure 1

- Title (Primitives) is confusing
  - We will change it to “Interaction Model between Layers”
- Do we really need “Response”?
  - We would like to keep it as the interaction model
- “Confirm” and “Response” are confusing
  - Christian suggested to swap them. We will ask the WG later, Q1



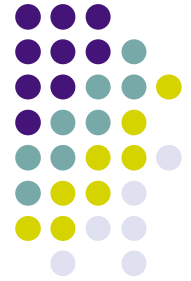


## 3 Types of Primitives

- The relation between the interaction model and primitives was not clear
  - Type 1: To provide L2 information to upper layers immediately
  - Type 2: To notify upper layers of L2 events asynchronously
  - Type 3: To control L2 actions from upper layers
- We will mention this in the beginning of Sec. 4

	request	confirm	indication	response
type1	○	○		
type2	○	○	○	△
type3	○	○		

○ · · Mandatory    △ · · Optional



# Do we need “Protocol ID”?

- There are more than one protocols in a layer. Protocol ID is necessary to identify a protocol
- Example:
  - Layer 3: IPv4, IPv6
  - Layer 2: Ethernet, CDMA



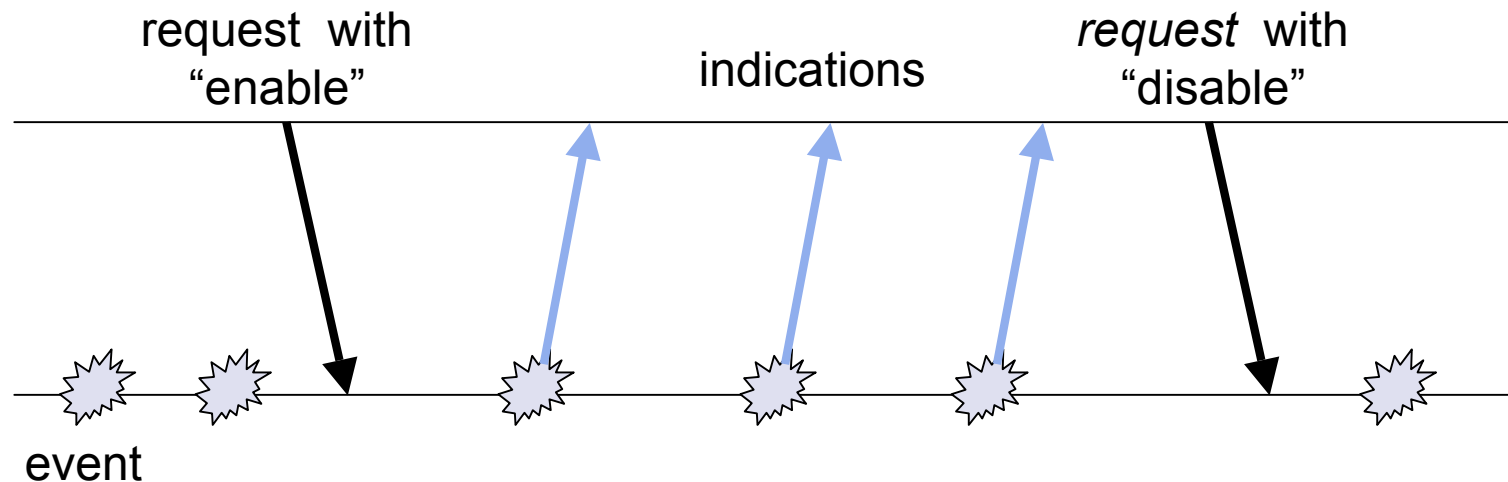
# “Peer” is confusing

- “Peer” has widely accepted end-to-end meaning, where a peer of node X is another node Y with X communicates at application layer
- Defining the peer to be an access point may be confusing
- Christian suggested to use “Point of Attachment” instead. We will ask the WG later, Q2



# Registration Procedure

- The registration procedure is unclear
  - Request of type2 must contain a parameter which directs to “enable” or “disable” event indication
  - Indications are sent as registered events occur until disabled
- We will add more text in the beginning of Sec. 4





# When PeerLost is sent?

- L2 creates a list of APs when it performs a scanning
- Next time a scanning is performed, it creates a new list and compares with the old one
- If there are differences, correspondent indications will be sent
  - PeerLost, PeerFound, etc.
- However, the timing of the scanning is an implementation issue



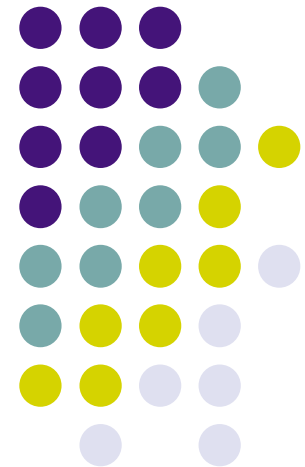
# How do we play with Channels?



- Jukka asked how L2 plays with channels
- L2-PeerList allows to get Peers on difference channels
- However, L3 does not need to specify channels
  - L3 just specifies a Peer and L2 understands which channel the Peer uses

# Questions to WG

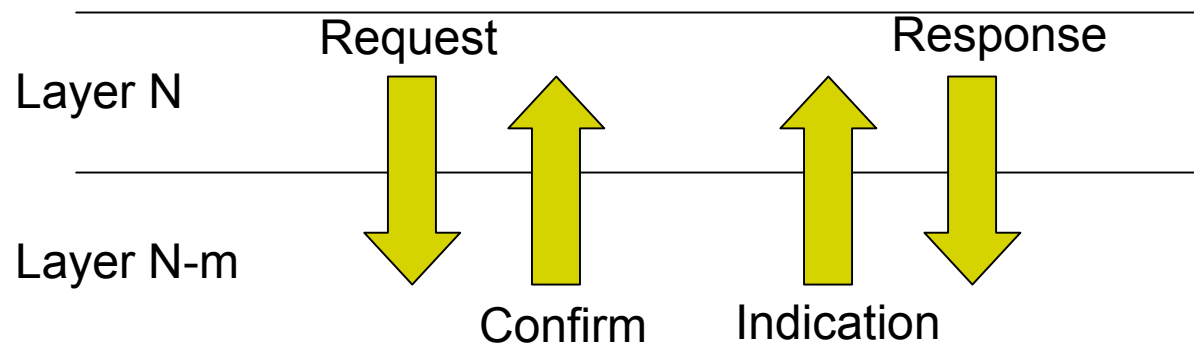
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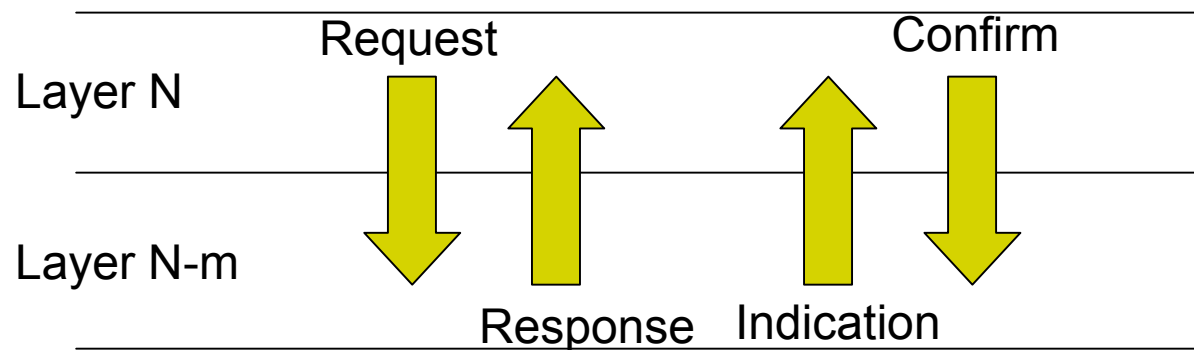


# Q1: Interaction Naming

- A: (current)



- B: (Christian's Suggestion)





## Q2: Peer to PoA

- Christian suggested to use “Point of Attachment” instead of “Peer”
- Do you agree to use PoA (Point of Attachment)? Or any other suggestions?

# Q3: Do we consider Infrastructure mode only?



- Jukka asked if it works with ad-hoc or mesh mode
  - It is out of scope. However, what about the WG interest?
- Do we need to support ad-hoc mode or mesh network as well?
  - YES/NO



## Q4: Security Awareness?

- Jukka suggested to add some kind of security awareness
  - i.e. whether the link is secure or not, to the link status primitive or to a filter associated to the PeerFound
- Do we need to support such security awareness?
  - YES/NO
- But, how can we abstract security awareness?
  - Maybe, ON or OFF is not enough.
  - e.g. Some requires 128bit WEP, not 40bit WEP. It is very difficult to say how secure the link is..

# Q5: Remove an anticipatory indication?



- Christian suggested:
  - to replace L2-LinkGoingDown indication by periodic or on-demand link status reports which notify an interested upper-layer protocol of link status changes
  - the upper-layer protocol can then make its own projections
- Proposal: replace L2-LinkGoingDown by L2-LinkStatusChange
  - YES/NO

# End of Slides

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Thank you!

