

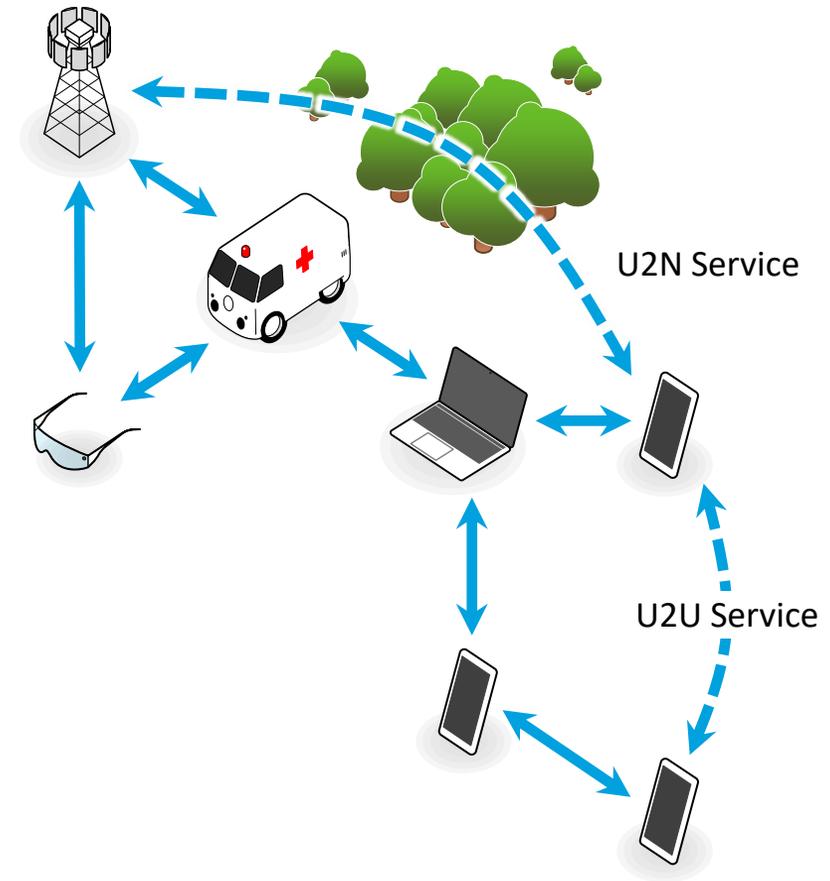
[RAN2 led] Further sidelink relay enhancements

[WI]

Further sidelink relay enhancements

Motivation

- Problem Statement
 - Integrate U2N/U2U relaying models for services from anywhere to anywhere
 - Multihop combining U2N and U2U
 - Service continuity in all scenarios
 - Integrate non-3GPP transport
 - Compare WiFi mesh—but it cannot integrate remote devices into 3GPP services by itself
 - QoS, compute offloading, separate identities/sessions for different devices...
- More dramatic network coverage extension, and ability to extend D2D services beyond the limited range of PC5
 - D2D has the potential to be a rich ecosystem (e.g. PAN with compute offload)
- Rel-18 U2U considers forward compatibility to multihop
 - Main impact is to SRAP design and UE implementation (routing)



Proposal

[1/2]

- Expand the Rel-17/18 relay design to offer seamless connectivity from anywhere in the network to anywhere else
 - Using PC5 or non-3GPP transport
 - E.g., WiFi connections with SRAP/PDCP/SDAP on top
- Network ↔ device and device ↔ device services already exist
 - Coverage of both is extended by relaying
 - Multihop allows network to reach devices far out of coverage (e.g. IoT devices in highly disadvantaged deployment locations)
 - Devices can extend services to distant peers
 - V2X: vehicles sharing environment/sensor information
 - Wearables: companion device linked to smartphone, even when OOC and the phone depends on a relay for network coverage
 - Peer-to-peer services: shared XR activities, headset ↔ phone ↔ phone ↔ headset
 - Service continuity enhancements so that receiving service through any combination of relays works as well as receiving service directly
- Rel-18 relay WI considers forward compatibility for U2U multihop
- Service continuity is available for U2N relay in Rel-17/18

Proposal

[2/2]

SA/CT Dependency: **Yes**

Key Message: Introduce support for multihop and multipath relay, as well as n3GPP transport for U2U/U2N

Objective I: Multihop for U2U (remote UE ↔ relay UE ↔ relay UE ↔ remote UE) [RAN2]

- SRAP, discovery, and (re)selection enhancements to support multihop routing
- Service continuity upon change of relay UE(s)
- Coordinated with SA2

Objective II: Multihop for U2N (network ↔ relay UE ↔ relay UE ↔ remote UE) [RAN2, RAN3]

- SRAP, discovery, and (re)selection enhancements to support multihop routing
- Service continuity upon change of relay UE(s) [and/or gNB]
- Coordinated with SA2

Objective III: Service continuity for multi-path [RAN2, RAN3]

- Extend U2N service continuity to multi-path scenarios

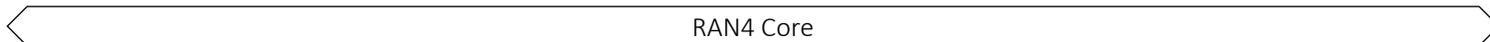
Objective IV: U2N and U2U relay with non-3GPP transport [RAN2]

- Lower layers use non-3GPP connectivity, with SRAP adapting the transport to 3GPP upper layers
- Leverage scenario 2 design from Rel-18

Expected TU

	2024												2025 [Calendar TBC at the time of writing]												2026		
	Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4			Q1		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
RAN	103			104			105			106			107			108			109			110			111		
R1	115b	116		116b	117			118		118b	119		119b	120		120b	121			122		122b	123		123b	124	
R2	124b	125		125b	126			127		127b	128		128b	129		129b	130			131		131b	132				
R3	122b	123		123b	124			125		125b	126		126b	127		127b	128			129		129b	130				
R4	109b	110		110b	111			112		112b	113		113b	114		114b	115			116		116b	117		117b	118	
R1	N/A			N/A	N/A			N/A		N/A	N/A			N/A		N/A	N/A										
R2				0.5	0.5			1		1	1			1		1	1			1							
R3				0.5	0.5			1		1	1			1		1	1			1							
R4 RD				0	0			0		0.25	0.25			0.25		0.25	0.25			0.5		0.25	0.25				0.25
R4 RF				N/A	N/A			N/A		N/A	N/A			N/A		N/A	N/A			N/A							

Study TU
Feature TU



Thank you!