

r i f e - p r o j e c t . e u

IETF 101: GAIA RG

Insights into RIFE field trial

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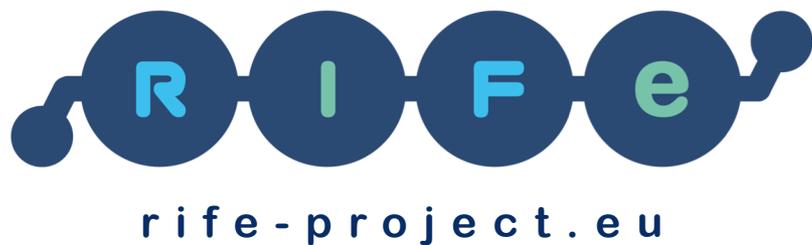
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Horizon2020 Programme



- Objectives
- Architecture background
- What we deployed
- Next steps



- Utilize new network architecture to provide a *better* Internet for community
- Better being
 - Easier to deploy (SW only)
 - Performance benefits for certain IP services
 - Enabling services hard to do (e.g., expensive) otherwise

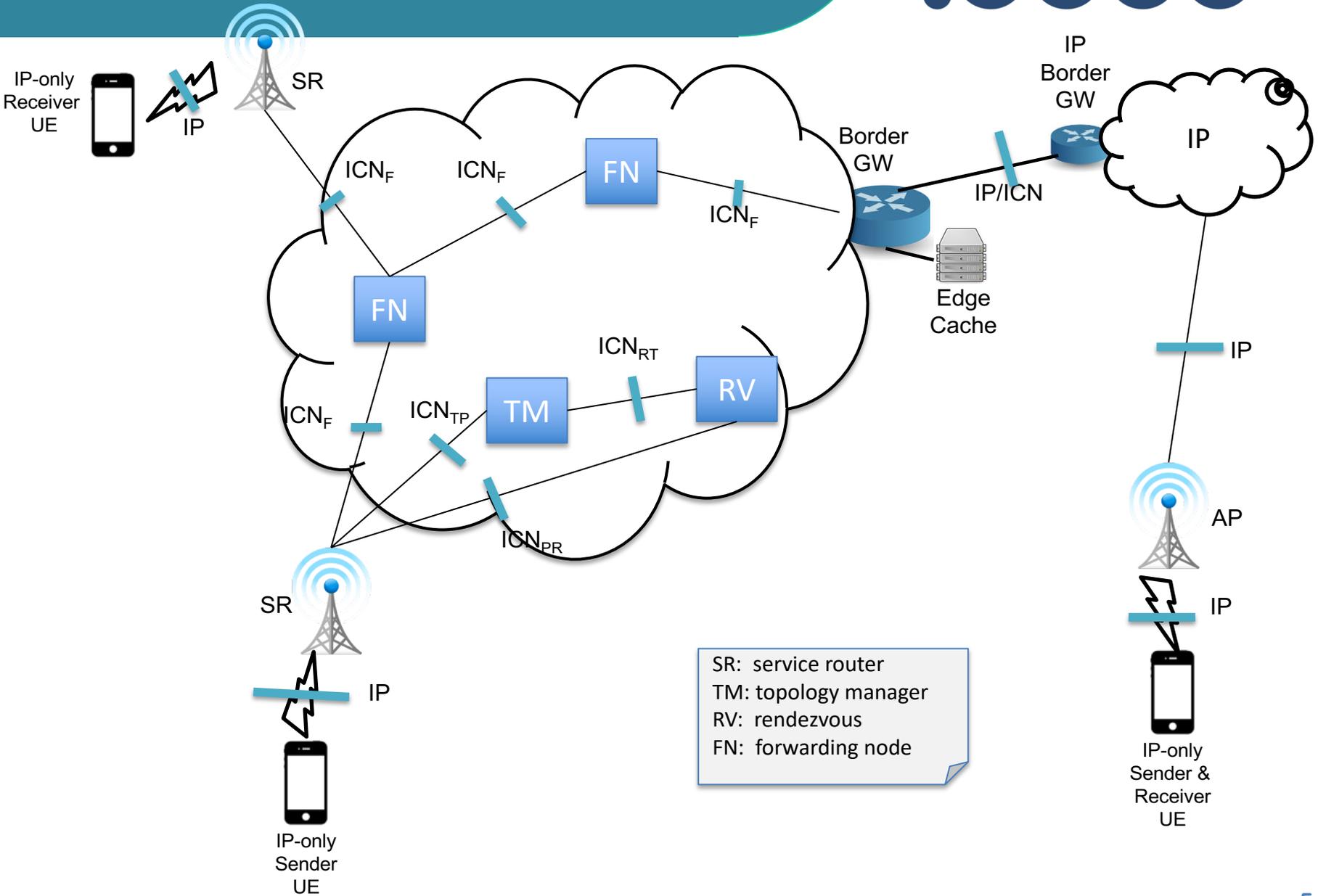


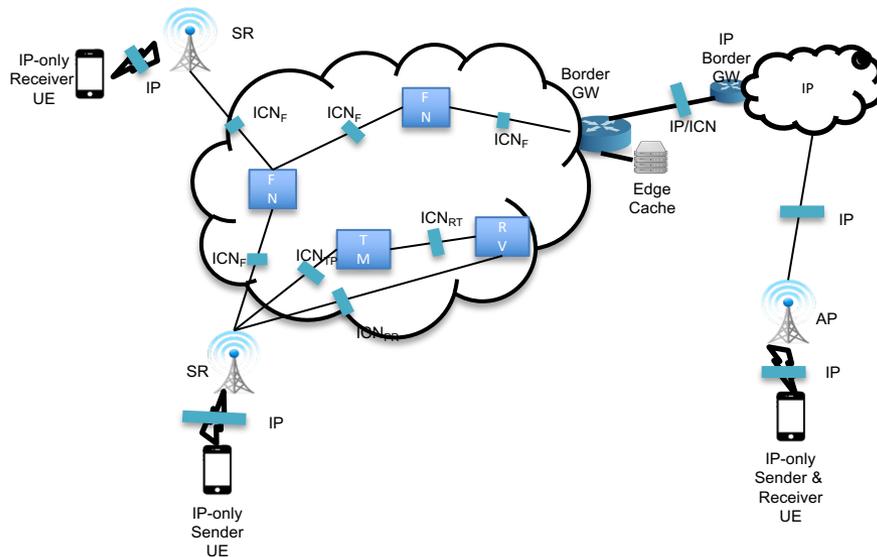
Architecture Background



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A Gateway-based System Architecture





- **IP-based services**

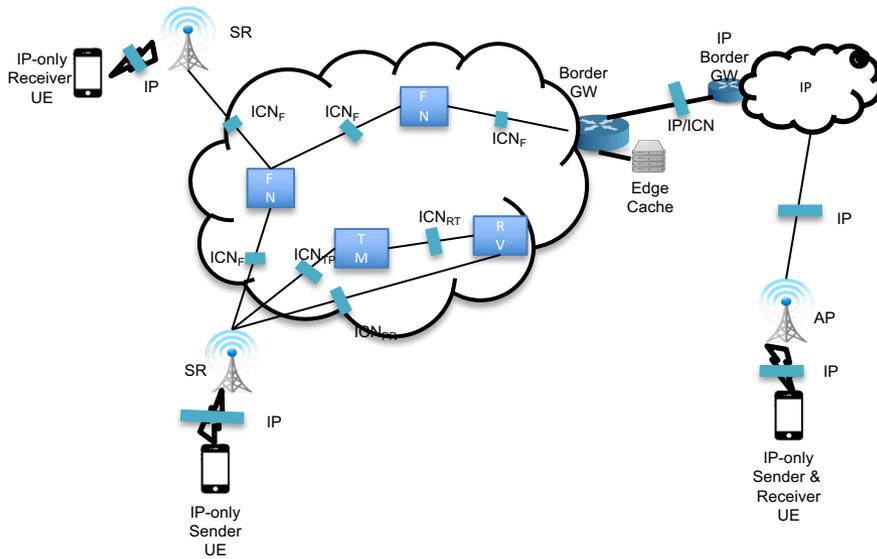
- Must support current Internet, but with better performance!
 - Address affordability and QoE aspects
- Foundations for other propositions, such as surrogates

-> IP/HTTPoverICN solutions

- **New services**

- Native ICN in selected areas?
- DTN-based services

-> new ways of providing universal access?



- **Deployment flexibility**
 - Well-planned
 - Well-connected, less well-planned
 - Less well-connected, little planning
 - Random encounters

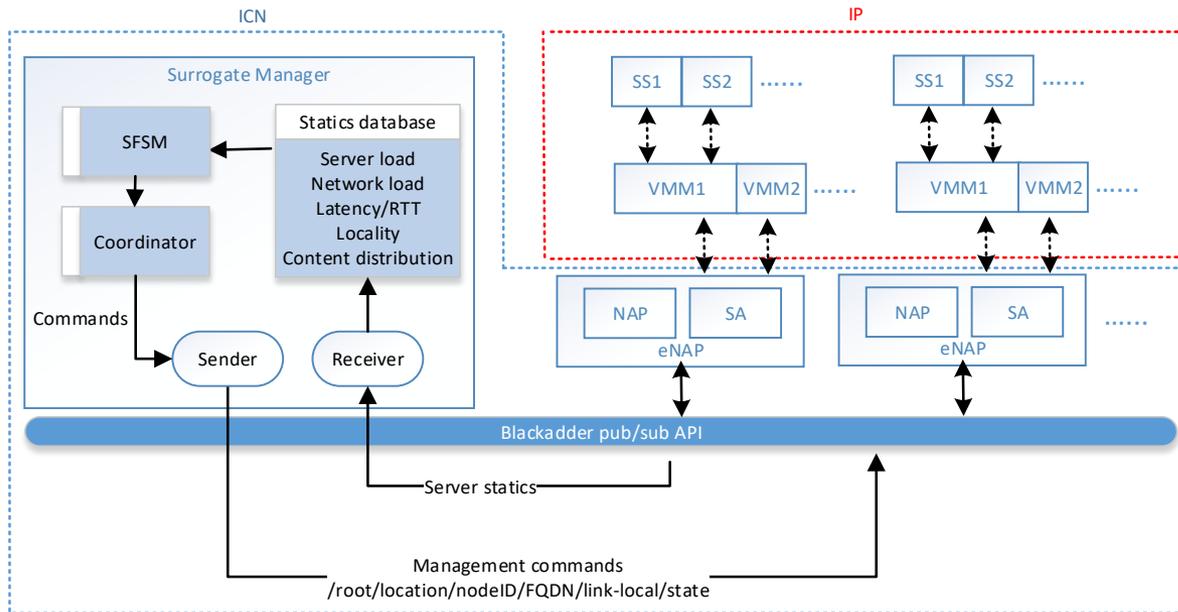
-> address affordability aspect

-> provide foundations for new operator models
- **Surrogate placement**
 - Place personalized surrogates in fronthaul

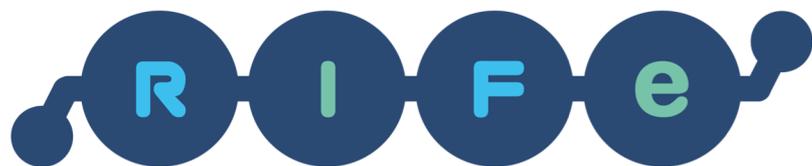
-> same feel, no special portals, still contextually relevant

Localization

Moving beyond Content only!



- Move from content retrieval to service routing over ICN!
 - Surrogacy is about moving computation and content at the same time!
 - Latency one target
 - Localization, i.e., cost, another
 - NFV integration done in new InterDigital FLIPS platform
- Control activation and placement of service surrogates
 - An ICN application alongside the basic SR functionality over the same ICN base prototype



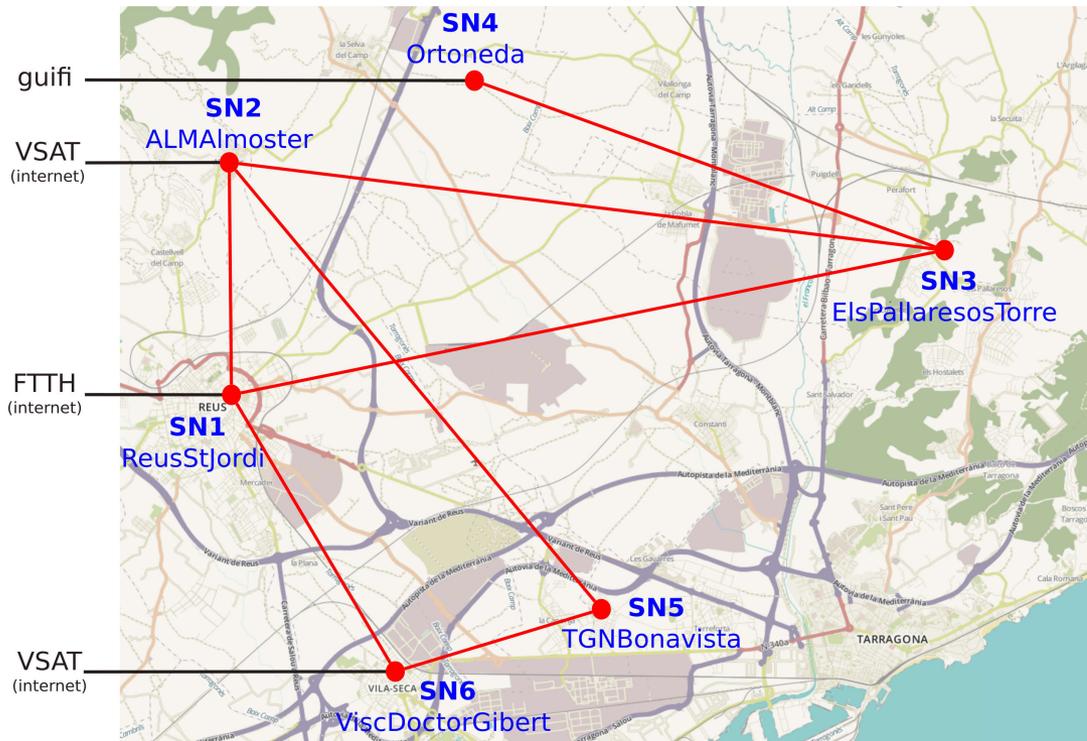
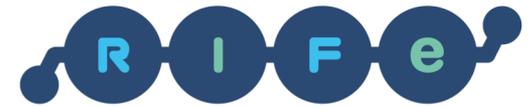
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Deployment



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Deployments: Field trial & Lab.

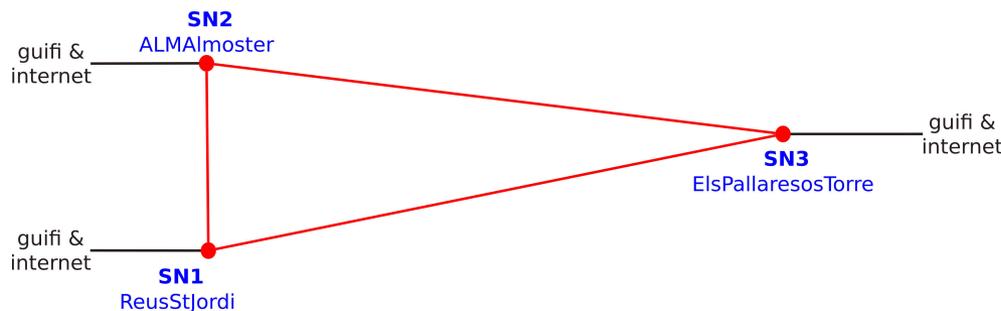


Field trial (FT)

- Location: **Tarragona** (Catalonia)
- Type network: **Production**
- Links technology: **WiFi**
- Backbone: **6 Supernodes**
- Access: **15 APs, >40 households**
- Provides: **Real world environment**

Laboratory (Lab)

- Location: **Barcelona** (Catalonia)
- Type network: **Experimental**
- Links technology: **WiFi & Ethernet**
- Backbone: **3 Supernodes**
- Access: **2 APs, some users**
- Provides: **Partial replica of FT for testing**



Supernodes' architecture



SN1 ReusStJordi

PtP SN2 ALMAImoster 10, 112, 212

PtP SN3 ElsPallaresosTorre 10, 113, 213

PtP SN6 ViscDoctorGibert6 10, 116, 216

Point to point links

VLANs

AP1 10, 11

AP2 10, 12

AP3 10, 13

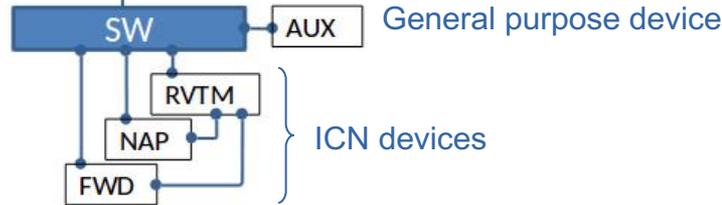
Point to point links

Outdoor
Indoor



FTTH Internet access

10, 21, 22, 23, 212, 213, 216



<https://guifi.net/node/77362> ReusStJordi Lat:41.160795 Lon:1.113514 10.142.40.1

Supernodes' components

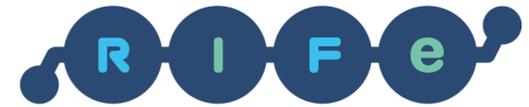


ICN	FWD	Forwarder	Has access to all PtP VLANs
	NAP	Network attachment point	Has access to all APs VLANs; the GW IP of each AP; can act as Internet Gateway
	RVTM	RendeVouz/Topology Manager	One per deployment
	MOOSE		One per deployment
General Purpose	AUX	Auxiliary device	Has access to all APs VLANs; one IP of each AP
	Client device	Emulates a full AP-Clients unit with LXC	
Network	PtP	Point-to-Point link	Between SNs. VLAN tags: 1XY for IP, 2XY for ICN, X first SN num, Y second SN num
	Access Point (P2M link)	Between SN and households. VLAN tags: 11 for AP1, 12 for AP2, 13 for AP3	
Internet-work	FTTH	Fibre to the home	
	Satellite connection		
	Guifi.net connection		



- Dual stack backbone (IP, ICN)
- ICN backbone links L2 addressable (VLAN 212, 213, etc.)
- Households attachable at AP level
- Core components always reachable via IP (management VLAN 10)
- IP and ICN constant monitoring

Deployments' implementation



Console -> Devices

10.139.40.111/cacti/host.php

console graphs

Console -> Devices

Logged in as admin (Logout)

Devices

Type: Any Status: Any Search: Rows per Page: 100 Go Clear

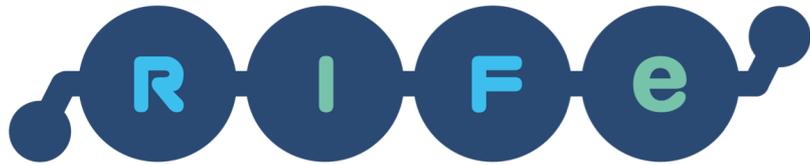
Showing All Rows

Description**	ID	Graphs	Data Sources	Status	In State	Hostname	Current (ms)	Average (ms)	Availability	
FT-SN1-AP1	52	4	4	Up	-	10.142.40.2	24.49	46.69	93.26	<input type="checkbox"/>
FT-SN1-AP2	53	4	4	Up	-	10.142.40.3	45.12	46.31	93.24	<input type="checkbox"/>
FT-SN1-AP3	54	4	4	Up	-	10.142.40.4	26.19	46.45	93.25	<input type="checkbox"/>
FT-SN1-AUX	30	7	7	Up	-	10.142.40.13	29.16	48.92	93.68	<input type="checkbox"/>
FT-SN1-FWD	27	8	8	Up	-	10.142.40.10	31.78	47.07	92.38	<input type="checkbox"/>
FT-SN1-NAP	47	7	7	Up	-	10.142.40.11	28.86	46.09	93.52	<input type="checkbox"/>
FT-SN1-PIP-SN2	61	6	6	Up	-	10.142.40.5	36.12	46.2	93.22	<input type="checkbox"/>
FT-SN1-PIP-SN3	62	6	6	Up	-	10.142.40.6	24.83	45.93	93.23	<input type="checkbox"/>
FT-SN1-PIP-SN6	63	6	6	Up	-	10.142.40.7	26.58	46.12	93.3	<input type="checkbox"/>
FT-SN1-RB	26	6	6	Up	-	10.142.40.1	33.5	48.15	93.45	<input type="checkbox"/>
FT-SN1-RVTM	48	4	4	Up	-	10.142.40.12	29.27	46.32	93.53	<input type="checkbox"/>
FT-SN2-AP1	55	4	5	Up	-	10.142.45.2	27.97	49.41	93.04	<input type="checkbox"/>
FT-SN2-AP2	56	4	4	Up	-	10.142.45.3	28.11	47.93	93.17	<input type="checkbox"/>
FT-SN2-AP3	57	4	4	Up	-	10.142.45.4	26.48	48.08	93.14	<input type="checkbox"/>
FT-SN2-AUX	35	5	5	Up	-	10.142.45.13	32.68	48.77	93.05	<input type="checkbox"/>
FT-SN2-avanti	71	3	3	Up	-	10.142.45.9	29.15	50.35	93.61	<input type="checkbox"/>
FT-SN2-FWD	32	8	8	Up	-	10.142.45.10	214.7	49.8	92.08	<input type="checkbox"/>
FT-SN2-MOOSE	70	0	0	Unknown	-	10.142.45.12	0	0	100	<input type="checkbox"/>
FT-SN2-NAP	33	5	5	Up	-	10.142.45.11	110.24	48.53	93.36	<input type="checkbox"/>
FT-SN2-PIP-SN1	64	6	6	Up	-	10.142.45.5	30.95	52.61	93.3	<input type="checkbox"/>
FT-SN2-PIP-SN3	65	6	6	Up	-	10.142.45.6	25.3	47.73	93.25	<input type="checkbox"/>
FT-SN2-PIP-SN5	66	5	5	Up	-	10.142.45.7	25.19	47.47	93.18	<input type="checkbox"/>
FT-SN2-RB	37	6	6	Up	-	10.142.45.1	47.42	48.45	93.42	<input type="checkbox"/>
FT-SN3-AP1	58	4	4	Up	-	10.142.33.2	47.01	47	93	<input type="checkbox"/>





- Ongoing discussions with community to replace prototype with InterDigital's FLIPS platform
 - Higher stability
 - Better security
- Extend trial for one year
 - Perform long-term observational studies in utilization and performance
 - Perform planned experiments regarding particular KPIs



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Thank you for your
attention



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