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Connectivity and Networks for XR systems

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Interactive Digital Narratives Stakeholders Technologies Methodologies framework Computer Interfaces Stories Display systems Design Authoring tools Evaluation and societal impact

IDN framework used for XR experiences



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Example: Sense-IT IDN framework



Example instantiation: XR experience



Connectivity and network requirements

Network: Capacity



From https://xr4all.eu/xr/

Network capacities

- Typical systems
 - 360 video
 - 4K media resolution
- Moving towards 8K media resolution
 - 3 Gbits/second cloud access for raw format
- Significant efforts in developing compression algorithms
 - Point clouds
 - Volumetric video
 - but still extreme requirements



Connectivity to XR system

- Local storage on HMD
 - Occulus quest 2 (256-512 GB storage)
- Local Wi-Fi access
- Wired



Examples and KPIs from Sense-IT

Home of the trolls AdMIRE 5GMediaHub



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http://www.iet-multimedialabs.org/senseit/

Troll i ord

Continuation of Home of the Trolls 2019-2021 Regionalt forskningsfond Trøndelag Kvalifiseringsstøtte Researchers, prototypes and demos



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Home of the Trolls

- Networks
 - Indoor
 - Wi-Fi
 - Outdoor
 - local storage in app
- GPS (Bad Elf)











Horizon 2020 European Union funding for Research & Innovation

Coordinator:Brainstorm Multimedia

H2020: IA - ICT55 September 2020 - September 2022



PRESENTATION TITTLE

Concept







Horizon 2020 European Union funding for Research & Innovation

NRK - Debatten





European Commission

TVR: Weather



European Commission

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Premier sports: week end round up





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Architecture



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Commission



5G experimentation environment for 3rd party media services





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- Story has working title *They Came Nova*
- Takes place within the They Came
 universe by Kapoow
- Linear narrative shown on first-screen, as encoded video stream with marked frames
- Each marked frame triggers action on second screen, where user interacts with the narrative via an application



Slide 20







Slide 21



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ID	UC Specific Service KPI	Baseline value (achievable with 4G)	Expected value	
UC1-SKPI-1	MTP Latency	>50	<10ms	
UC1-SKPI-3	Rendered Video Quality	>4MOS	>4MOS	
SKPI-1	Application latency	>50ms	<10ms	
SKPI-2	Stall probability	<0.1%	<0.1%	
SKPI-3	Frame Error Rate	<0.1%	<0.1%	
SKPI-4	Video litter	0.5%	0.1%	
SKPI-8	Video bitrate	100Mbps	1000Mbps	
SKPI-9	Frame Rate	30fps	>30fps	
SKPI-10	Video Resolution	-	8k-30fps	

GMedia **HUB** KPIs to be measured and target values



ID	Network KPI	Expected value	
CKPI-1	Peak throughput UL (per device)	50 Mbps	
CKPI-2	Peak throughput DL (per device)	800 Mbps	
	Natwork Pandwidth III. (total concurrent doviace nor heam(site)	90 Mbpa	
CKPI-4	Network Bandwidth DL (total concurrent devices per beam/site)	1000 Mbps	
CKPI-5	End-to-End Latency for interactive applications (RAN, Core, Transport, Application)	< 30ms	
CKPI-6	Transport Network Latency	< 10ms	
CKPI-7	RAN latency	< 4ms	
CKPI-12	Jitter	< 4ms	

ID	Experimentation Facility KPI	Expected value
PKPI-9	MEC CPU usage	<50%
PKPI-10	MEC RAM usage	<50%
PKPI-11	Cloud CPU usage	<75%
PKPI-12	Cloud RAM usage	<75%

END OF PRESENTATION Thank you!



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