Loka Soperater in 868 mtz, 905 mtz, 433 ntz Coptionally 2 h los bragband) uses thing spread spectrum Modulation for probustness aguital the inserface. -> Supports very long-range frammissions svery low power Consumption Snalles multi-year bettery life Loka physical layer · [low power) freq. Bands Chin spread long spechum/ Range >866M+3 Multi-year Buttery Cofe -) 905 MHz > chirps Encode Judo lokun Rural ~u33mHz GRobust to Intertage - 2549ttz tounto 3 km Orban LORAGIAN Scomprises End Denies (Sensors), Gateway, Archword Severand Application Sover. > Snd Device Communicate with Gateways using Mod of LoRa. > Gateways fromwood afato neproresener over IP. Greatores Snot of Snd AES -128 Energy tion for recurred dola End Devices long Range & Catenays To burd weavone Sux pafa forward (Range-10km(3km) App Server (and to and AES Everynt)

gigtoy High-Metwork Capacity cong Range - 10 tosokn Random Access with freq. Diversity. Low power Consumption Application Seners End Devices other Narrow Band Communication Sigfox Cloud Pata forwarding Buse Stations secure UPN Support System Connection week " " " get if you he the lawy on this 6 LOWPAN Applayer 28 V6 Adapt MAC 802.15-4 2-44#3 physfal, Range-2009 Nodes-100 Sensor Nøde Rolle-2008bps low power N8-IOTN elwork Architecture othralow power Consumption Enhanced Coverge with popelitions NB FOT Perices LTE Modale / NB LTE 200 kg CTE NETWORT Integration PNODEB Base Station Duta Route TApp Severs Core Network

CAT-MI Network Architecture; > High datarate you I Maps. (AT-M(Dovices) ->low labercy vs NB-Fot-CIE do (I-MMHZ) Source Model.

eNo les Base Sation

21 Transmission

Core Network EAS/.

Smart wireless Sys. Feeh Comparison

	1	- Marie	
wireless Handard	Pover	Transmission Remoje	Desta Rest of
Muetooth	Medium	1+0100m	lto 3 mbps
Dwefooth LE	Lower	>100m	
Lorawan	Cow	Lotm	las Kbps to ambps
NB-Iot	low	<35tin	0.3to so Esps.
NFC	low	clocm	20 Mps to 5 mps
Sigfox	low	3 to 3000)	losts kaylers
blowpan -	low	loom	Coo to 600 bps
20ail/wifi	" Mediu m	conto Several Em with boosless)	040 230 tbps
bee	low		Co to coot maps
2 wave	low	lotoron	20 to 250 bbps
T		istorom	9:640 40thps
PHOTON IN	o class of the	Tolor Lib 14	

LIE retwork Integration

No single Dot wireless tech fits all needs, choice depot or bulneing the power varged data rate for the specific applications.

lase-study-Vijogawoda flood. golar Panel > Buttery) Ovober Arudino. Uno Board Arunidity sersor Riverflow GSM(GPRS) -> Cloud Internet > Dutabase Jenor Rain Senson -1/13 System uses an Ardusio uno boundas the core contrale, for Hood Mori towing & response. Solar panels La battery Snrure autonomout operation, vital during disaster londition ->sensors Monitor Critical parameters-writer level, river flow, heir full, terreporatura humid by. The system origges ar claim for savy wining thransmits readings via asMGPRS to a remote database sever over the Internar--Mad-fine desa supports streetive flood mainagement through timely alers ovel centralized monitoring. dulation Is why fast Tag can but scanned with less distance bles readers of Tag by using only low-warefergth, high frequency Radiowary i- The Toll-Yales - copy not high & low f R. coang) Answer Beeuup, Near-field lommunication principle (NFC) - High frey caus (1336 Nots) in low & range Enable Efficient inductive Coupling blu rader stag susuring wirell power transfer tolata Communication within a short range. Hso Due to Injecteuraced Regulation, Precesse Heleding zort & Power, lost Efficiery-longerwardingth signals way alicul farther reads but need bigger antennal increased power and rease complexity, Interference of Security risks. So we use high found Radio wares fastags.