
VoerEir

KPIs

1. A future with many Edge Cloud providers and omni present Edge Cloud deployments is inevitable.

2. Clear definitions of the Edge KPIs are required to match the application to an Edge infrastructure with the required capability

3. The de facto standards must be defined in a way that both considers the application requirement and the infrastructure capabilities

4. Edge KPIS are an essential part of the de facto standards required

What's driving these developers to adopt edge computing?

Bandwidth and latency dominate

Why edge?	Retail & Wholesale – Location Based Services	Augmented Reality / Virtual Reality	Video/Media (Upstream & Downstream)	Drones: Unmanned Traffic Management	Drones: Data Processing & Analytics
	Local real-time analysis of location data	Offload processing power and maintain real-time interaction	Low latency streaming and capacity (Bursting)	Autonomous navigation	Avoid cost of moving data to central cloud
Latency Critical Compute	▮	▮▮▮	▮▮▮	▮▮▮	▮
Heavy I/O	▮▮▮	▮▮▮	▮▮	▮▮	▮▮▮
Geo-Spatial knowledge		▮		▮▮	
Hyper-Local Grouping		▮		▮▮▮	▮
Data Residency	▮▮	▮▮	▮	▮▮	▮▮
	Radius Networks	1000 realities, arvizio, Hologight	Section, SMART MOBILE LABS	ATRIUS	ATRIUS

Source STL Partners

Latency requirements vary across use cases

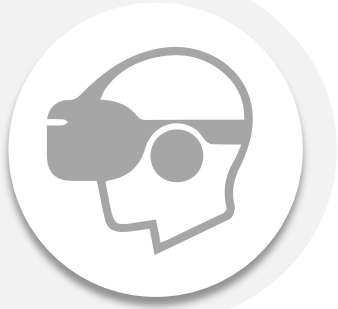
1000 realities

33ms — 2D model rendering

20-25ms — LTE + edge

20ms — 3D model rendering

15ms — Private LTE + edge



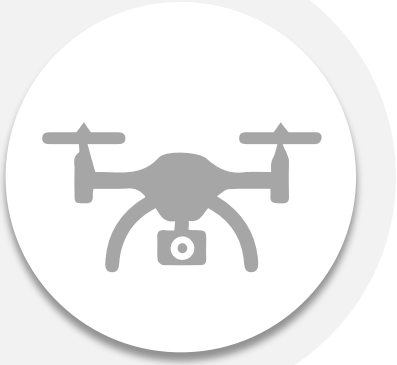
ATRIUS

100+ms — LTE

100ms — Initial target for drone comms

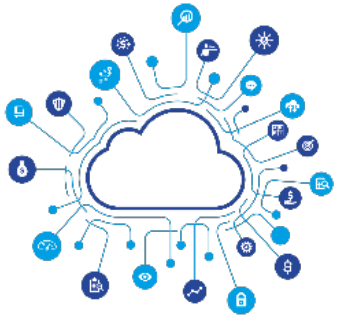
20-50ms — Target for scaled drone comms

1-10ms — Ultimate target drone comms



Source STL Partners

Manage Edge Complexity- Test Automation



Cloud Infrastructure is Complex

- Mitigating Cloud Infrastructure complexity is essential to deliver on end user expectation of experience

Complexity is Increasing x3

1. New advanced **application** requirements **(Edge KPIs)**
2. Distribution and increase of cloud infrastructure **sites** (Edge Cloud)
3. Increase of Cloud Infrastructure **providers** (Edge Cloud)

Manage Complexity through Automation

- Move from ad-hoc manual approach and fragmented tool usage to automate away complexity
- Learn and program once and leverage automation to secure operation

- **Touchstone is the market leading Test Automation product for Edge Cloud Infrastructure**

Akraino Release 3

1 *6 New R3 Blueprints (total of 20) covering use cases across Telco, Enterprise, IoT, Cloud and more*

2 *Akraino Blueprints cover areas including MEC, AI/ML, Cloud, Connected Vehicle, AR/VR, Android Cloud Native, smartNICs, Telco Core & Open- RAN, with — ongoing support for R1-R2 blueprints and more*

3 *Community delivers open edge API specifications — to standardize across devices, applications (cloud native), orchestrations, and multi-cloud — via new white paper*

Project Expectations

- Project Name: *Kontour* *(an outline representing or bounding the shape or form of something)*
- Define Edge requirements from various perspectives/categories.
  - Application Requirements
  - Edge Site Requirements
  - Security Requirements
  - Miscellaneous requirements
- Define KPIs based on above requirements/categories.

Example KPI from LFN Edge - Kontour project

- Current version of KPIs

S.No	KPI Name		Description	Measurement Unit
1	KT_KPI_NET_JITTER	Network	Measure of jitter between two workloads	milliseconds
2	KT_KPI_NET_TCP_BW	Network	Network TCP Bandwidth between two workloads	Gbps
3	KT_KPI_NET_PING_LAT	Network	Ping Lateny between two workloads	milliseconds
4	KT_KPI_NET_UDP_LAT	Network	UDP Lateny between two workloads	milliseconds
5	KT_KPI_NET_UDP_THPUT	Network	UDP throughput between two workloads	Gbps
6	KT_KPI_NET_UDP_PKT_LOSS	Network	Packet loss between two workloads	Packets lost per million packets
7	KT_KPI_COMP_CPU_SCORE	Compute	CPU Performance as per index score	CPU Index Score
8	KT_KPI_COMP_IPS	Compute	Measure CPU performance as instructions per seconds	Instructions per second
9	KT_KPI_COMP_MEM_LAT	Compute	Maximum Memory latency of a workload	nanoseconds
10	KT_KPI_COMP_MEM_BW	Compute	Memory bandwidth of a workload	Mibyte/sec
11	KT_KPI_STG_SEQ_RW_LATENCY	Storage	Read Write latency in the workload for sequential readwrite operation in 70:30 ratio.	microseconds
12	KT_KPI_STG_SEQ_READ_ONLY_IOPS	Storage	Storage IOPS of a workload for sequential read-only operation	Input/Output Operations Per Second
13	KT_KPI_STG_SEQ_WRITE_ONLY_IOPS	Storage	Storage IOPS of a workload for sequential write-only operation	Input/Output Operations Per Second
14	KT_KPI_STG_RAND_RW_LATENCY	Storage	Read Write latency in the workload for random readwrite operation in 70:30 ratio.	microseconds
15	KT_KPI_STG_RAND_READ_ONLY_IOPS	Storage	Storage IOPS of a workload for random read-only operation	Input/Output Operations Per Second
16	KT_KPI_STG_RAND_WRITE_ONLY_IOPS	Storage	Storage IOPS of a workload for random write-only operation	Input/Output Operations Per Second
17	KT_KPI_K8S_API_JOB_CREATE_READ_DELETE	API	Kubernetes API performance for job creation, read and delete	Success Rate %
18	KT_KPI_K8S_API_POD_CREATE_DELETE	API	Kubernetes API performance for pod creation and delete	Success Rate %
19	KT_KPI_K8S_API_NS_CREATE_DELETE	API	Kubernetes API performance for namespace creation and delete	Success Rate %
20	KT_KPI_K8S_API_REPCONT_CREATE_SCALE_DELETE	API	Kubernetes API performance for replication controller creation, scale and delete	Success Rate %
21	KT_KPI_K8S_API_REPSET_CREATE_SCALE_DELETE	API	Kubernetes API performance for replica set creation, scale and delete	Success Rate %
22	KT_KPI_K8S_API_STATEFULSET_CREATE_SCALE_DELETE	API	Kubernetes API performance for statefulset creation, scale and delete	Success Rate %
23	KT_KPI_K8S_API_DEP_CREATE_READ_DELETE	API	Kubernetes API performance for deployment creation, read and delete	Success Rate %
24	KT_KPI_K8S_API_NODEPORT_CREATE_CHECK_DELETE	API	Kubernetes API performance for nodeport creation, check and delete	Success Rate %
25	KT_KPI_K8S_SEC_CIS_COMPLIANCE	API	Kubernetes security score measured via CIS benchmark	Security Score
26	KT_KPI_K8S_CONF_E2E_SIG_AUTH	API	Kubernetes conformance for sig-auth	Compliance %age
27	KT_KPI_K8S_CONF_E2E_SIG_STORAGE	API	Kubernetes conformance for sig-storage	Compliance %age
28	KT_KPI_K8S_CONF_E2E_SIG_INSTRUMENTATION	API	Kubernetes conformance for sig-instrumentation	Compliance %age

S.No	KPI Name		Description	Measurement Unit
28	KT_KPI_K8S_CONF_E2E_SIG_INSTRUMENTATION	API	Kubernetes conformance for sig-instrumentation	Compliance %age
29	KT_KPI_K8S_CONF_E2E_SIG_APPS	API	Kubernetes conformance for sig-apps	Compliance %age
30	KT_KPI_K8S_CONF_E2E_SIG_CONFORMANCE	API	Kubernetes conformance for Conformance	Compliance %age
31	KT_KPI_K8S_CONF_E2E_SIG_NODE_CONFORMANCE	API	Kubernetes conformance for NodeConformance	Compliance %age
32	KT_KPI_K8S_CONF_E2E_SIG_API_MACHINERY	API	Kubernetes conformance for sig-api-machinery	Compliance %age
33	KT_KPI_K8S_CONF_E2E_SIG_NETWORK	API	Kubernetes conformance for sig-networrk	Compliance %age
34	KT_KPI_K8S_CONF_E2E_SIG_CLI	API	Kubernetes conformance for sig-cli	Compliance %age
35	KT_KPI_K8S_CONF_E2E_SIG_SCHEDULING	API	Kubernetes conformance for sig-scheduling	Compliance %age
36	KT_KPI_SVC_NGINX_MAX_LATENCY	Service	Maximum latency in NGINX in serving requests	milliseconds
37	KT_KPI_SVC_REDIS_MAX_THPUT_1MS	Service	Redis Server Max Throughput for Latency Under 1ms	requests/sec
38	KT_KPI_SVC_MONGO_THPUT	Service	Mongo throughput for database operations per second	operations/sec
39	KT_KPI_K8S_NODE_HEALTH	Service	Check health of K8S nodes to be in ready state	Nodes in Ready state
40	KT_KPI_K8S_SYS_NS_HEALTH	Health	Check health of all pods in kube-system namespace	All pods in running state
41	KT_KPI_OS_API_NOVA_CRUD	API	OpenStack Nova API CRUD performance	Success Rate %
42	KT_KPI_OS_API_NEUTRON_CRUD	API	OpenStack Neutron API CRUD performance	Success Rate %
43	KT_KPI_OS_API_GLANCE_CRUD	API	OpenStack Glance API CRUD performance	Success Rate %
44	KT_KPI_OS_API_CINDER_CRUD	API	OpenStack Cinder API CRUD performance	Success Rate %
45	KT_KPI_OS_API_REFSTACK	API	OpenStack API compliance based on RefStack guidelines	Compliance %age
46	KT_KPI_OS_API_TEMPEST_NOVA	API	OpenStack Nova API functional verification	Compliance %age
47	KT_KPI_OS_API_TEMPEST_NEUTRON	API	OpenStack Neutron API functional verification	Compliance %age
48	KT_KPI_OS_API_TEMPEST_GLANCE	API	OpenStack Glance API functional verification	Compliance %age
49	KT_KPI_OS_API_TEMPEST_CINDER	API	OpenStack Cinder API functional verification	Compliance %age
50	KT_ENC_RSA_SIGN_4096	Encryption	Measure of 4096 bit RSA signatures	Signatures/second
51	KT_ENC_RSA_SIGN_2048	Encryption	Measure of 2048 bit RSA signatures	Signatures/second
52	KT_ENC_RSA_SIGN_1024	Encryption	Measure of 1024 bit RSA signatures	Signatures/second
53	KT_ENC_RSA_SIGN_512	Encryption	Measure of 512 bit RSA signatures	Signatures/second
54	KT_AES128_CBC_THPUT_256	Encryption	Measure of throughput for AES CBC throughput for 256 bytes block	Gb/second
55	KT_AES128_CBC_THPUT_1024	Encryption	Measure of throughput for AES CBC throughput for 1024 bytes block	Gb/second
56	KT_AES128_CBC_THPUT_8192	Encryption	Measure of throughput for AES CBC throughput for 8192 bytes block	Gb/second