

VOL-904: Correlation of Log Messages

User Story Description:

As an operator, I should be able to correlate all the log messages that pertain to a single user request in sequenced order

Solution Approach:

- ❑ Utilize Runtime Context for tracing the sequence of logs generated for a execution of code flow
 - ❑ Modify each method to pass Context as first argument to ensure propagation across the full execution path
 - ❑ Enrich Context at start of operation to store attributes like unique id and operation name to enable correlation
- ❑ Extend Logging framework to extract context attributes
 - ❑ Pass context as first argument to each logging call
 - ❑ Extract and log attributes from supplied context as fields in each log statement

PoC done to validate the Feasibility

Enrichment of Context at Start of Operation

```
func (handler *APIHandler) ListDevices(ctx context.Context, empty *empty.Empty) (*voltha.Devices, error) {  
    → ectx.Enrich(&ctx, "operation-name", "list-devices")  
    ectx.Enrich(&ctx, "txn-id", uuid.New().String())  
    → logger.DebugC(ctx, "ListDevices")  
    devices, err := handler.deviceMgr.ListDevices(ctx)
```

Log Output

```
{"level":"debug","ts":"2020-03-31T15:42:49.243Z","caller":"core/device manager.go:383","msg":"ListDevices","instanceId":"voltha-rw-core-59cd694dc-h8q7d","pkg":"core","operation-name":"list-devices","txn-id":"5338861d-d339-4db7-8068-7d0197319738"}  
{"level":"debug","ts":"2020-03-31T15:42:49.243Z","caller":"model/proxy.go:206","msg":"proxy-list","instanceId":"voltha-rw-core-59cd694dc-h8q7d","pkg":"model","txn-id":"5338861d-d339-4db7-8068-7d0197319738","operation-name":"list-devices","effective":"/devices","operation":"PROXY_LIST","path":"/devices"}  
{"level":"debug","ts":"2020-03-31T15:42:49.243Z","caller":"model/node.go:258","msg":"node-list-request","instanceId":"voltha-rw-core-59cd694dc-h8q7d","pkg":"model","operation-name":"list-devices","txn-id":"5338861d-d339-4db7-8068-7d0197319738","depth":0,"deep":false,"txid":"","path":"/devices","hash":""}  
{"level":"debug","ts":"2020-03-31T15:42:49.243Z","caller":"model/persisted_revision.go:353","msg":"loading-from-persistence","instanceId":"voltha-rw-core-59cd694dc-h8q7d","pkg":"model","txn-id":"5338861d-d339-4db7-8068-7d0197319738","operation-name":"list-devices","path":"devices","txid":""}  
{"level":"debug","ts":"2020-03-31T15:42:49.243Z","caller":"model/persisted_revision.go:364","msg":"retrieve-from-kv","instanceId":"voltha-rw-core-59cd694dc-h8q7d","pkg":"model","txn-id":"5338861d-d339-4db7-8068-7d0197319738","operation-name":"list-devices","path":"devices","txid":""}  
{"level":"debug","ts":"2020-03-31T15:42:49.243Z","caller":"db/backend.go:195","msg":"listing-key","instanceId":"voltha-rw-core-59cd694dc-h8q7d","pkg":"db","operation-name":"list-devices","txn-id":"5338861d-d339-4db7-8068-7d0197319738","key":"devices","path":"service/voltha/devices"}  
{"level":"debug","ts":"2020-03-31T15:42:49.243Z","caller":"db/backend.go:107","msg":"update-liveness-channel-reason-interval","instanceId":"voltha-rw-core-59cd694dc-h8q7d","pkg":"db","operation-name":"list-devices","txn-id":"5338861d-d339-4db7-8068-7d0197319738"}
```

Execution/Processing Context : Proposed Group and Attributes

Context Group	Attributes	Description	Injection Points
Application	instance-id	Indicates VOLTHA component performing the processing	main method of component. Injected into each logger instance
Transaction	txid, opname	Transaction indicates trigger coming from outside the voltha application (Northbound API, OLT, Etcd callback etc.) and will be represented by Unique Transaction Id and Operation name	NBI Handler, Openolt Indications, Kvstore change events
Request	reqid, task	Request indicates trigger coming from another voltha component for performing some task and will be represented by Unique Request Id and task name	Inter Container Proxy, NBI Handler
Device	deviceid	Represent device identifier	NBI Handler, Device Manager, Request Handler

Challenges and Unknowns

- ❑ Propagation of Context across the Channels used for Async Processing
 - ❑ The struct used in Channels would need to be extended to pass context as well
- ❑ Should Transaction Id be propagated across the voltha components for easier correlation