



# Considering ALTO as Network Exposure Function

draft-contreras-alto-ietf-nef-01  
draft-contreras-alto-service-edge-05  
draft-lcsr-alto-service-functions-01

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[draft-contreras-alto-ietf-nef-01](#)

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[draft-contreras-alto-service-edge-05](#)

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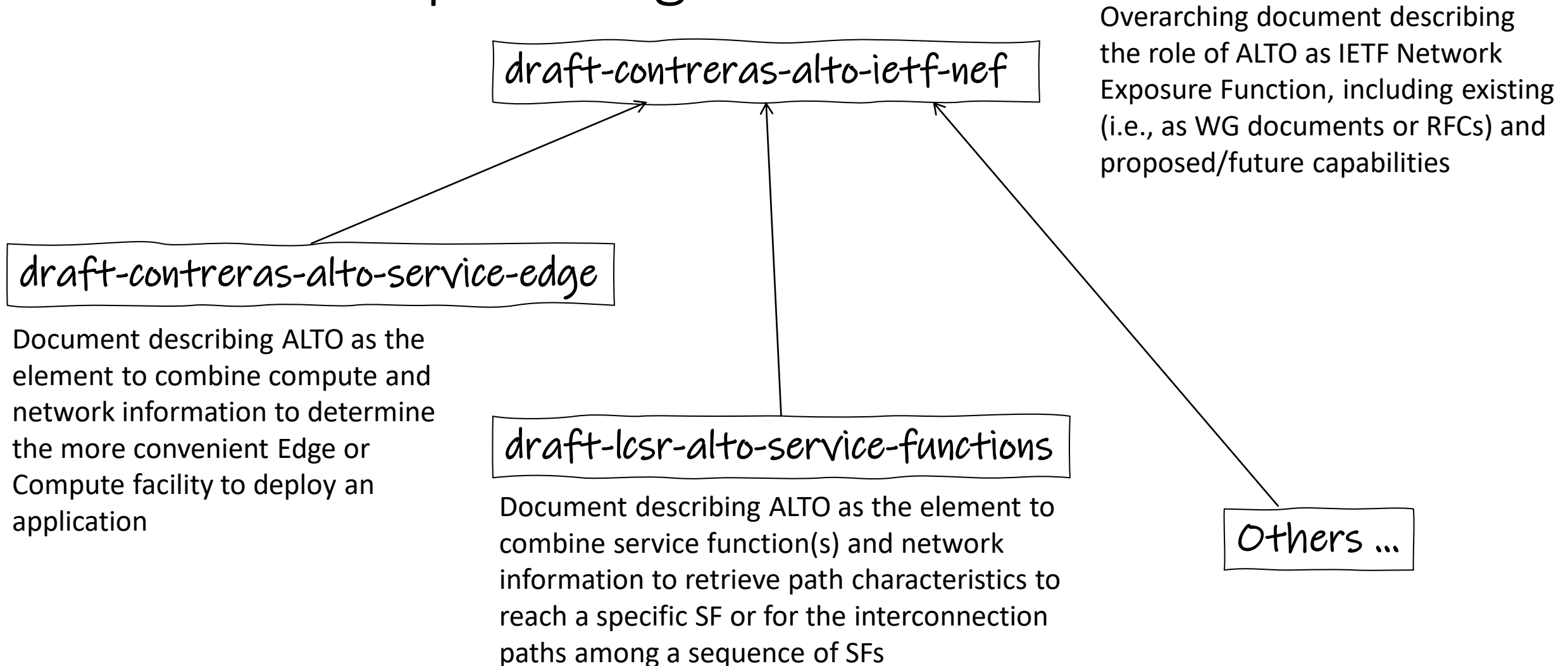
[draft-lcsr-alto-service-functions-01](#)

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# Relationship among drafts



# draft-contreras-alto-ietf-nef

## Problem statement

- Networks are becoming consumable by applications and services
- Applications can be enabled to make informed decisions based on information retrieved from the Network instead of inferring or guessing network capabilities or status

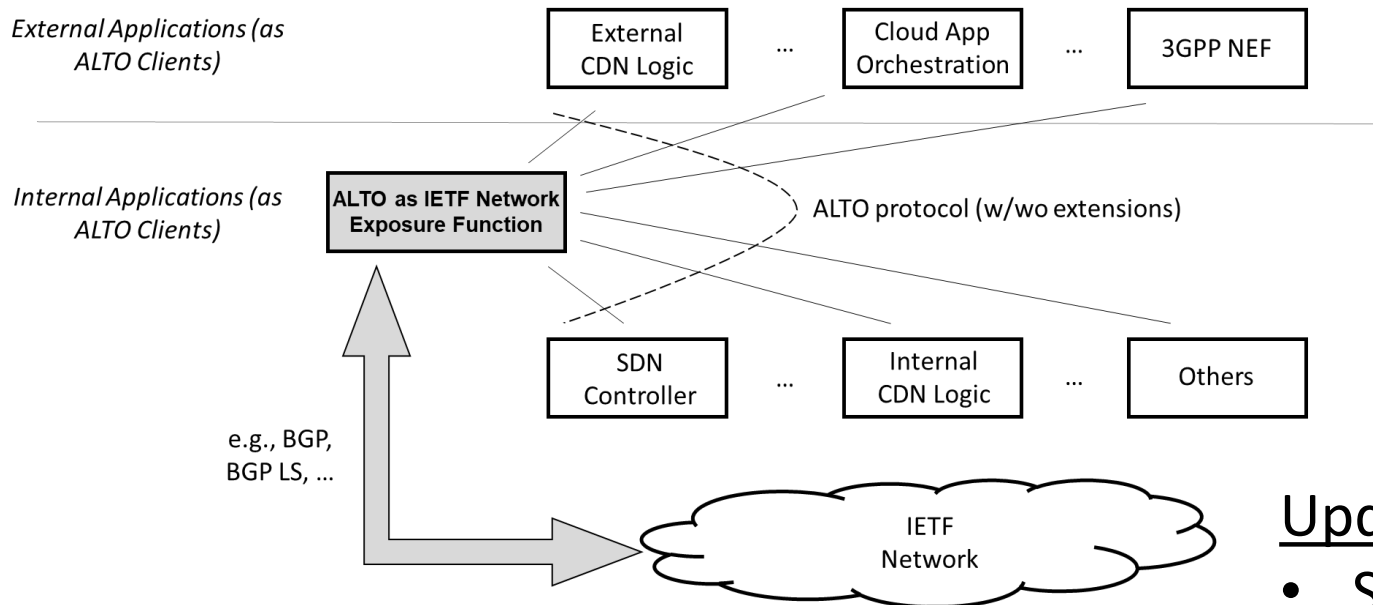
- Current version -01
- Aligned with current industry trends on Network-Application Integration
- Initiatives with similar scope in other SDOs: 3GPP Network Exposure Function, ETSI MEC APIs, O-RAN RIC, Linux CAMARA, ...

## Solution

- ALTO providing information to support optimization decisions on applications
- Existing and foreseen extension will extend the catalog of information exposure enabled by ALTO
  - Existing: topology+costs, performance metrics, segmented network view, etc
  - Proposed: optimal service edge, service functions, abstraction of underlay for overlays (e.g., cellular, CDN, ...), dynamic IP address pools (CUPS), ...

## Updates in version -01

- Service functions, security



# draft-contreras-alto-service-edge

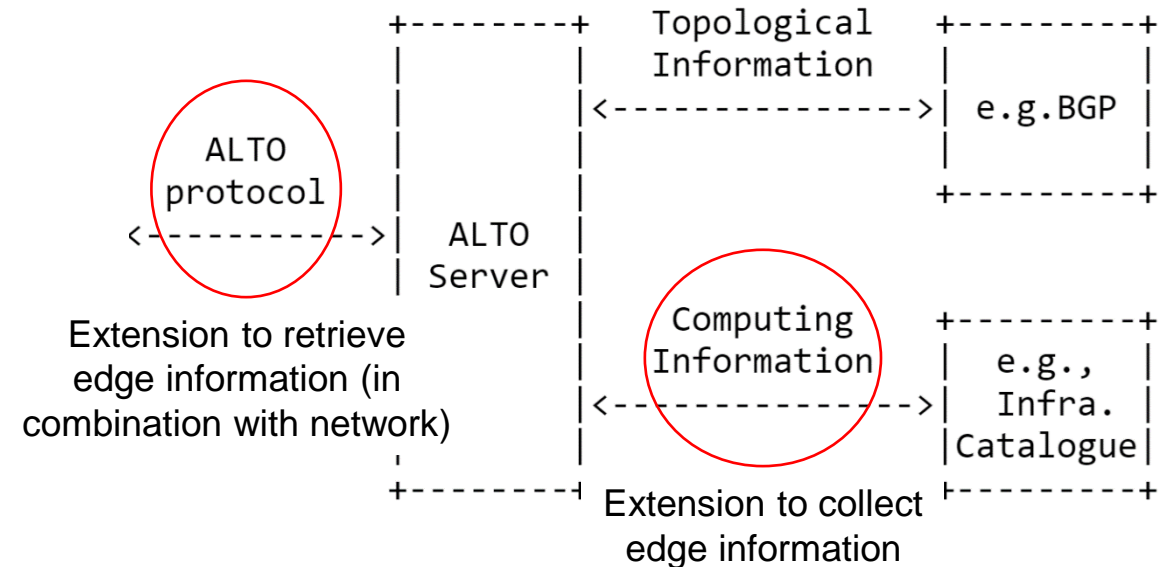
- Current version -05
- Related with Compute Aware Networking discusión, being ALTO an off-path solution

## Problem statement

- Multiple (heterogenous) DC - Data Centers across the network featuring resources (CPUs, memory, storage, bandwidth, etc)
- Identify the suitable DC to deploy a given application considering both compute and transport information

## Solution

- Leverage the ALTO protocol (+ext) to assist on the selection of the “best” edge, combining both network & compute info.
  - Optionally complemented with other inputs such as performance metrics, etc



## Updates in version -05

- Potential extensions for path vector & unified properties under analysis to define an edge server as both an IP and an ANE entity
- Example queries provided for filtered entity property map

## Problem statement

- Network services are commonly formed by means of the concatenation of several atomic service functions (SF), resulting in a connected graph of functions
- Typically, there is more than one instance of an atomic service function deployed in the network
  - For e.g. load balancing, redundancy, traffic optimization, etc
- The service realization needs to select the most suitable SF instance
- Selection would be improved with network information such as number of hops, associated performance metrics, etc, that characterize:
  - The path to reach a particular SF instance or type of SF
  - The interconnection paths among a sequence of SFs

## *draft-lcsr-alto-service-functions*

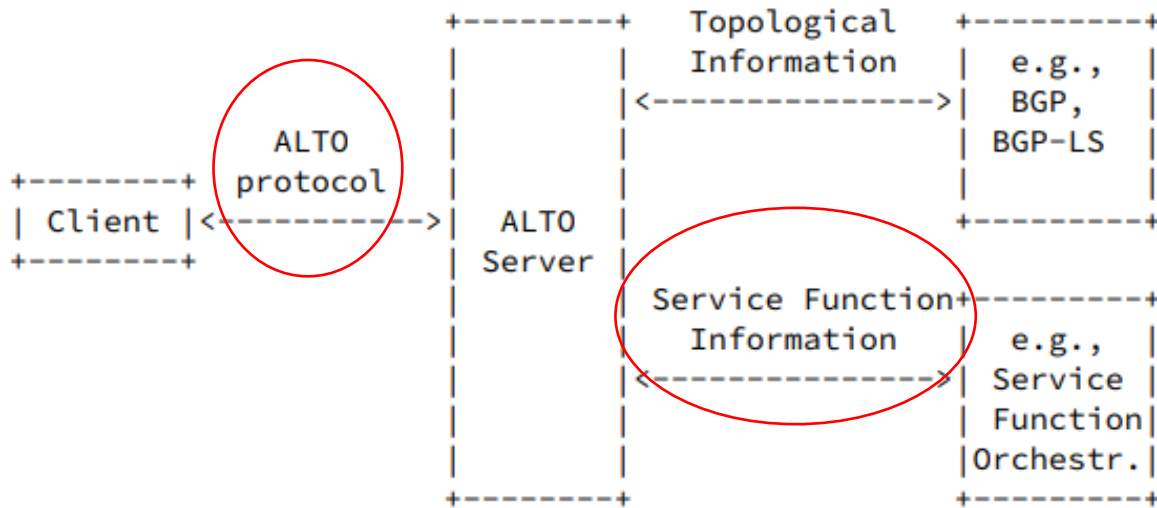
# Some ALTO information of interest (examples)

Assuming that application endpoints are located in PIDs

- Path characteristics, from a PID, to any instance of a service function type.
- Path characteristics, from a PID, to a specific instance of a service function type.
- Path characteristics among any instance of a service function type X to any other instance of a service function type Y.
- Path characteristics among a specific instance of a service function type X to any other instance of a service function type Y.
- Path characteristics, from a PID, to a chain of service functions.
- Path characteristics, from a PID, to a chain of specific instances of service functions.
- etc

# *draft-lcsr-alto-service-functions*

## ALTO for SF information retrieval



Link with related activities in IETF

- Service Function Chain - SFC
- Service Programming with Segment Routing – SPRING
- SF Aware TE Topology – TEAS

Link with related activities outside IETF

- VNF graphs - ETSI NFV

- Network topological information (+ metrics, etc) complemented with information relative to SFs (as provided e.g. by an orchestration system)
- Proposed ALTO extensions
  - Extension to enable ALTO clients to request information of interest
  - Extensions to collect and combine both service function and network information
- These extensions can involve particularizations of both [I-D.ietf-alto-path-vector] and [I-D.ietf-alto-unified-props-new].

# Next steps

- Work on the different aspects covered by these drafts for future ALTO re-chartering
- Complement existing linked IETF work leveraging on capabilities exposed by ALTO
- Prepare updated versions of the overviewed documents with advances for IETF 115
- Comments/feedback are more than welcome