Service Distribution in OSPF

draft-pillay-esnault-ospf-service-distribution-03.txt

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Outline

- Evolution of requirements for data
- What is this draft proposing?
  - Service Access Points discovery
  - Directory of service producers and consumers
  - New architecture with separation of service data dissemination
- Next Steps
- Questions?

Why?

- Currently, some applications leverage the routing protocols reliable flooding to propagate their data to the peers.
- The applications/services have limited amount of data.
- However, the data is flooded all over the flooding domain regardless whether it is useful or needed.
- The current methodologies will just not work for very large payload of application data or large number of services.
- The draft will address data scale limitation along with a number of new requirements.

Evolution of Requirements

- Network requirements
  - Scale to a large number of services
  - No assumption regarding topology of network
  - Must handle dynamic events in network
  - There is no assumptions regarding producers and consumers of services, their location or uniqueness
  - Must support incremental deployment
- Data handling requirements
  - No assumption on size, format or nature of data
  - Routing and service data separated and independent
  - Routers only store and process data of interest
  - Secured data may reside only on some routers

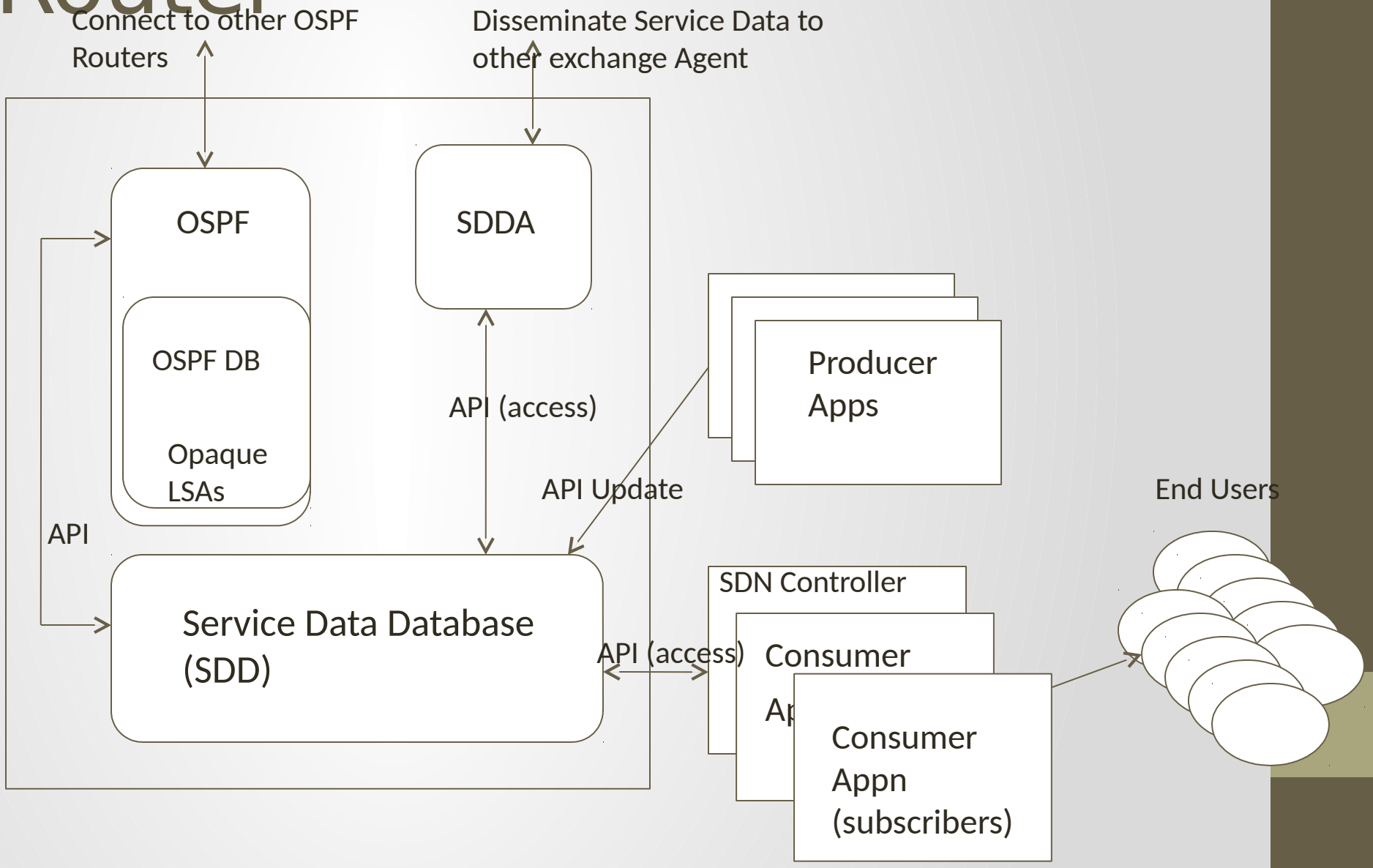
Evolution of Requirements for data dissemination

- Additional Requirements
  - Backward compatible with current routing protocol
  - Minimal/No impact on routing convergence and performance
  - Ability to compute the shortest path to a producer or consumer of a service per IGP metrics or Service metrics.
  - Ability to choose source by geographic proximity in future

Service Distribution Router (SDR)

- SDRs form a logical overlay and rely on the IGP for reachability and computation of best paths
- Leverages the IGP capability to discover other SDRs and flood only topological information of the SDR
  - Ability to compute the shortest path to a producer or consumer of a service per IGP metrics or may use service metrics.
  - Advertise the directory of service producers and consumers directly known to it
- Actual data propagation may be delegated to an external agent and not done in IGP (flexibility of methodology and outside scope of this document)

Service Distribution Router



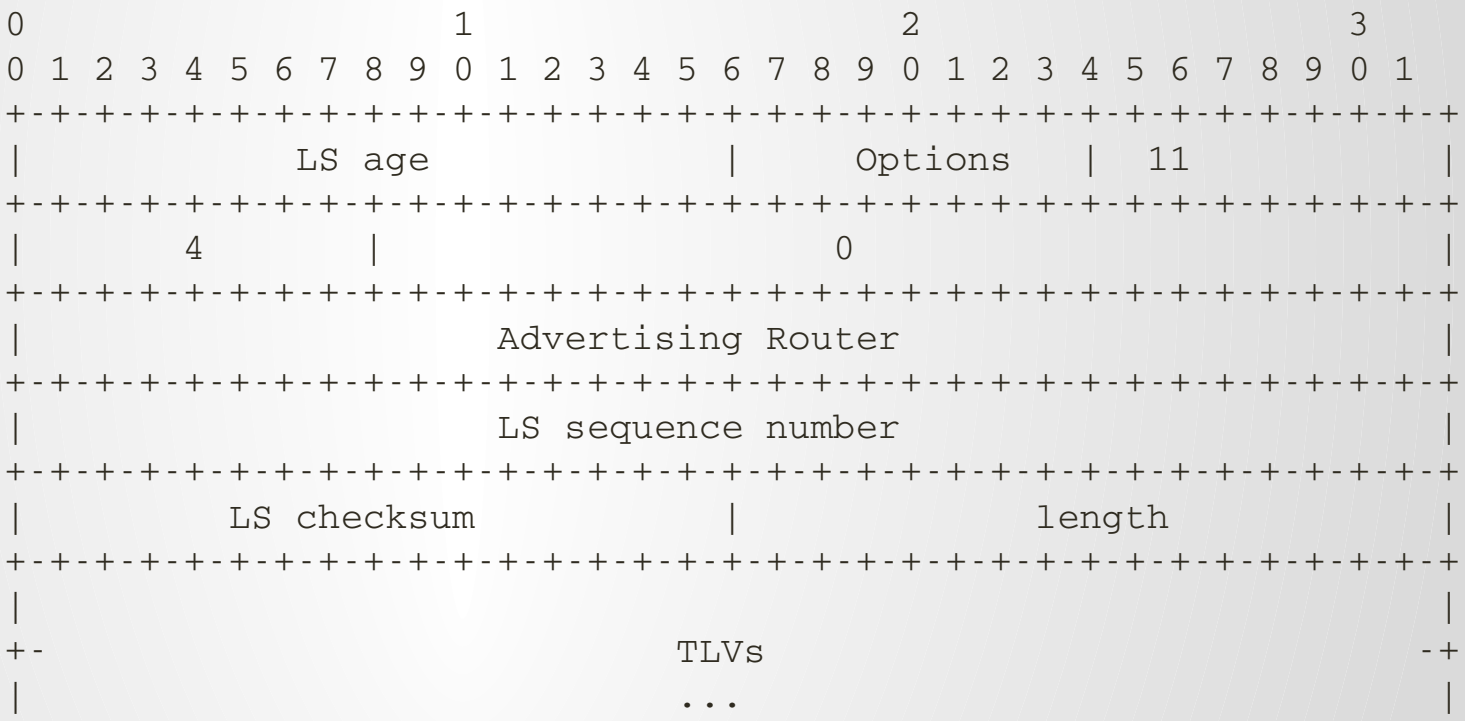
Service Distribution Router Operations in IGP

- Topological Data dissemination
  - Producer Operations
    - New producer App advertises a service
    - Existing Producer App starts or stops advertising a service
  - Consumer Operations
    - A new consumer App joins with new subscriptions
    - An existing consumer adds or stops subscriptions

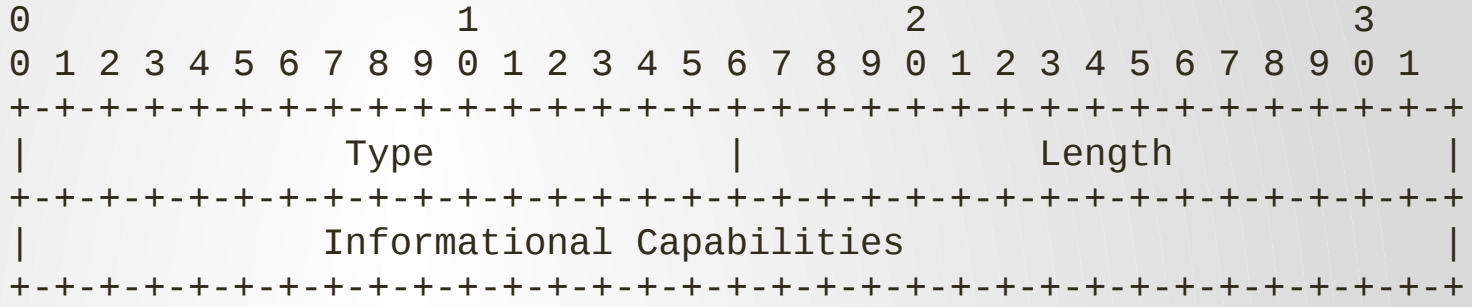
- Discovery
  - Leverage the IGP SPF to calculate the route to the other SDR, producers and consumers. SDR or service metrics may override IGP metric if desired.

Service Distribution Router Discovery

- The Router Information LSA carries the Capabilities TLV.



Service Distribution Router Discovery



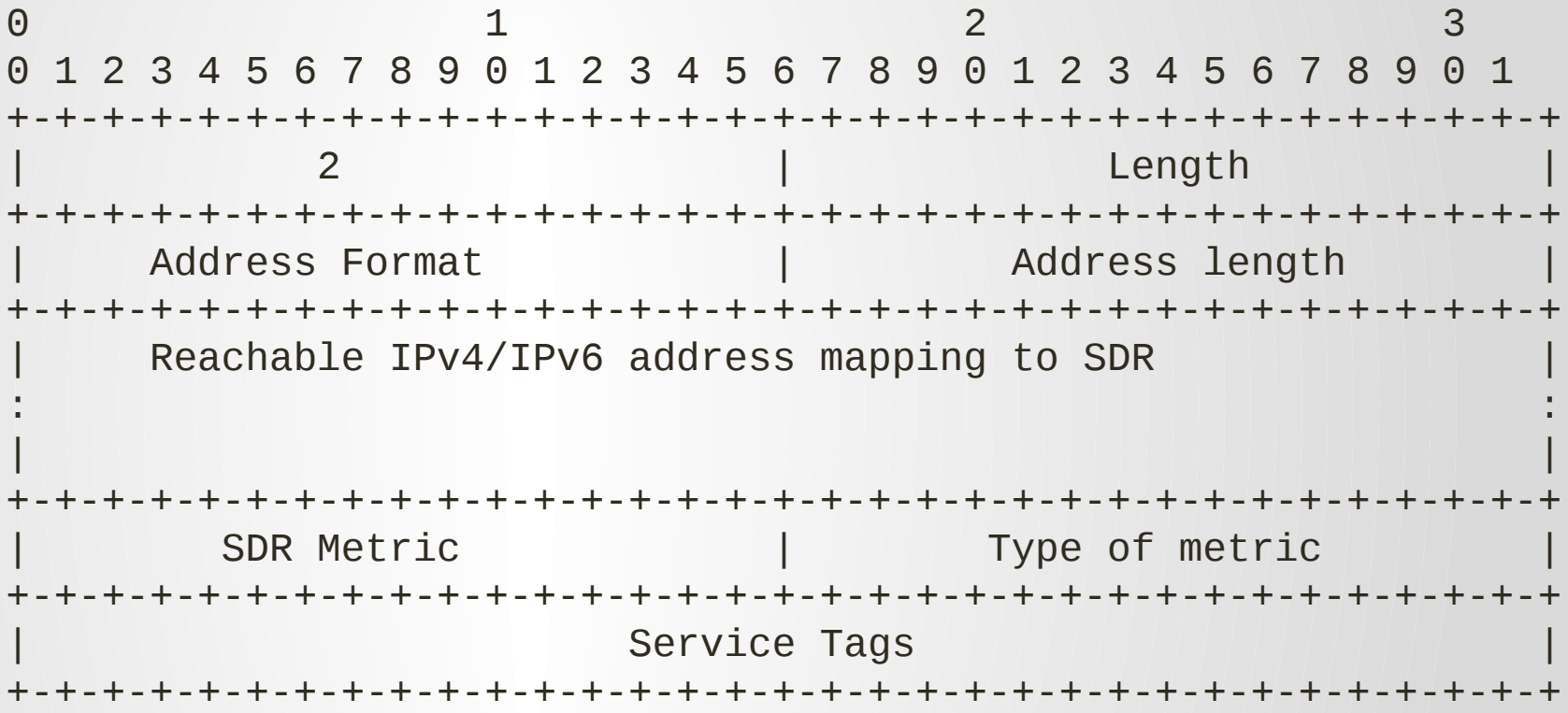
- The Router Informational Capabilities TLV is used to identify this SDR capability of the router

Bit:6 - Service Distribution Router Capable

Flooding Scope: AS

Service Distribution Router Discovery

- Address Mapping of SDR – Resolvable Router ID or address



SDR metric: A 16-bit field that indicates SDR metric greater than 0

Type of metric:

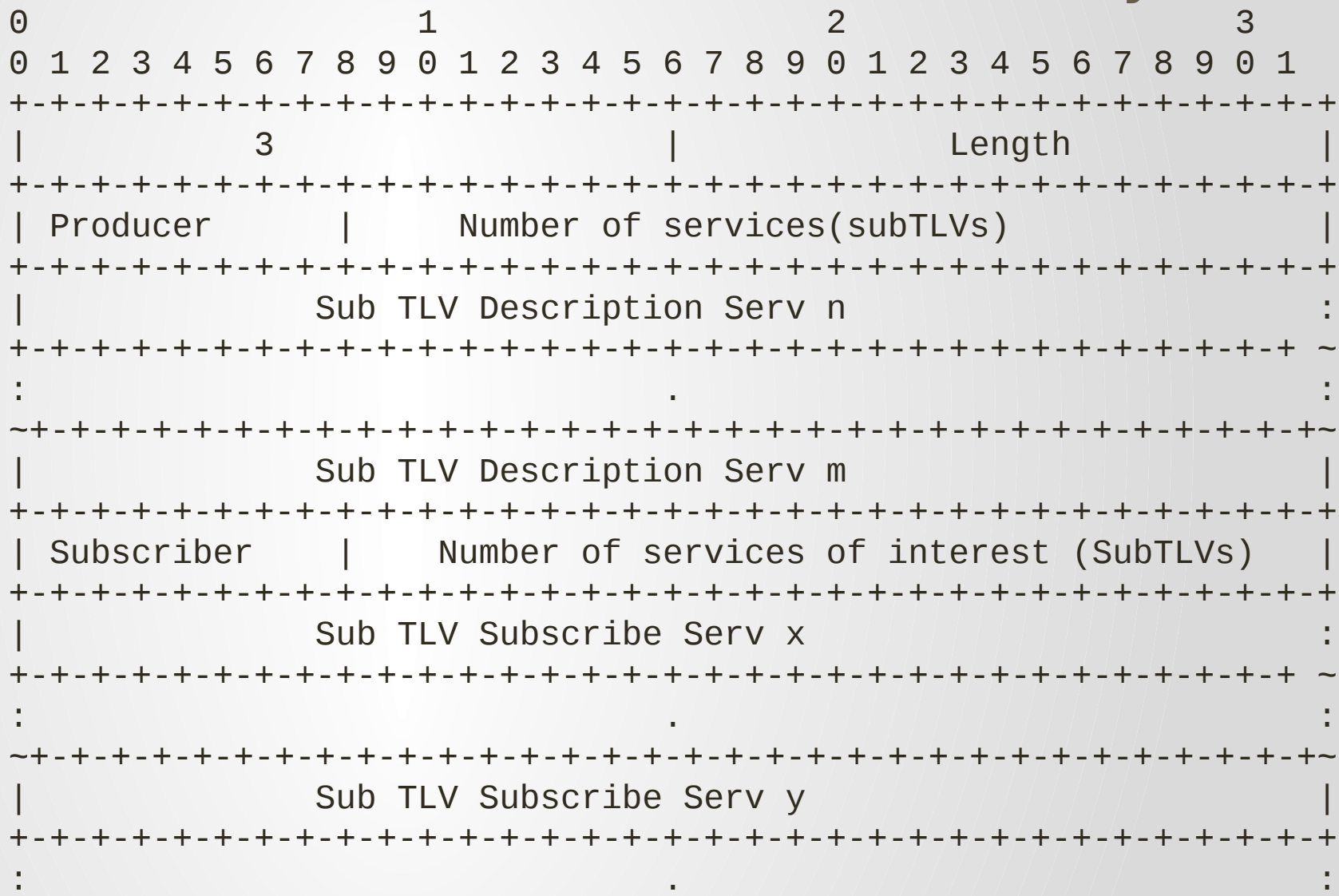
0 : None defined - Ignore SDR Metric

1 : SDR metric overrides the IGP metric

2 : Computed metric is composite of IGP metric + SDR metric

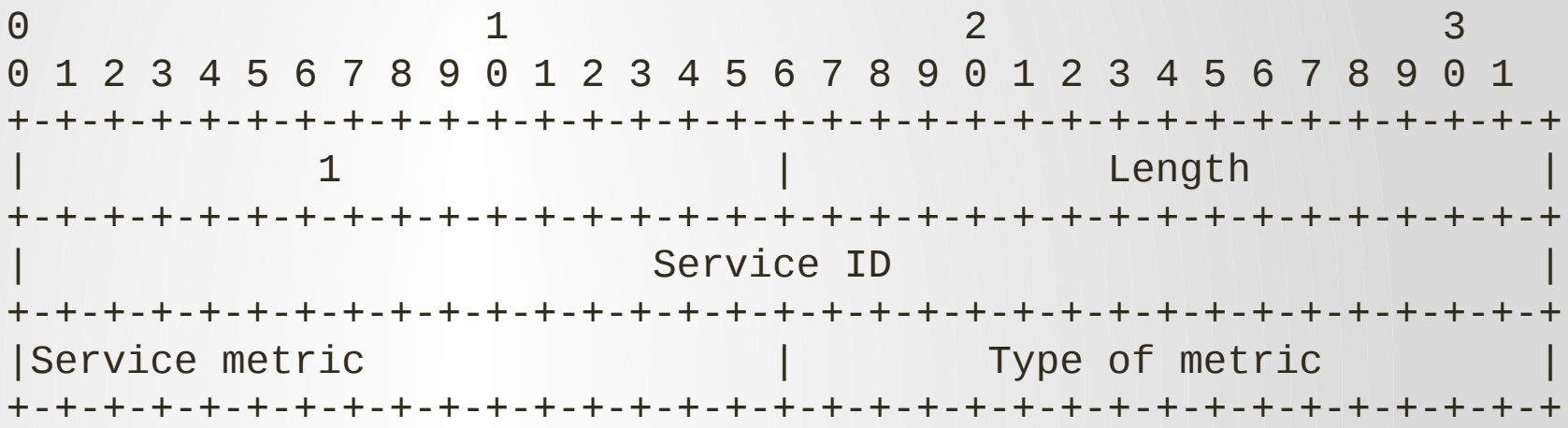
Service Tags: A 32-bit field representing the Service Tags. Service tags may be used for policy purposes. This TLV is applicable both to OSPFv2 and OSPFv3

Service Distribution Router Discovery



Service Distribution Router Discovery

Service Description Sub-TLV



Service ID: A 32-bit field representing the Service Identifier. This TLV is applicable both to OSPFv2 and OSPFv3.

Service Metric: A 16-bit field that indicates the metric associated with the service. A metric of 0 would represent undefined. An unreachable or oversubscribed service has a metric of 0xFFFFFFFF.

Type of metric:

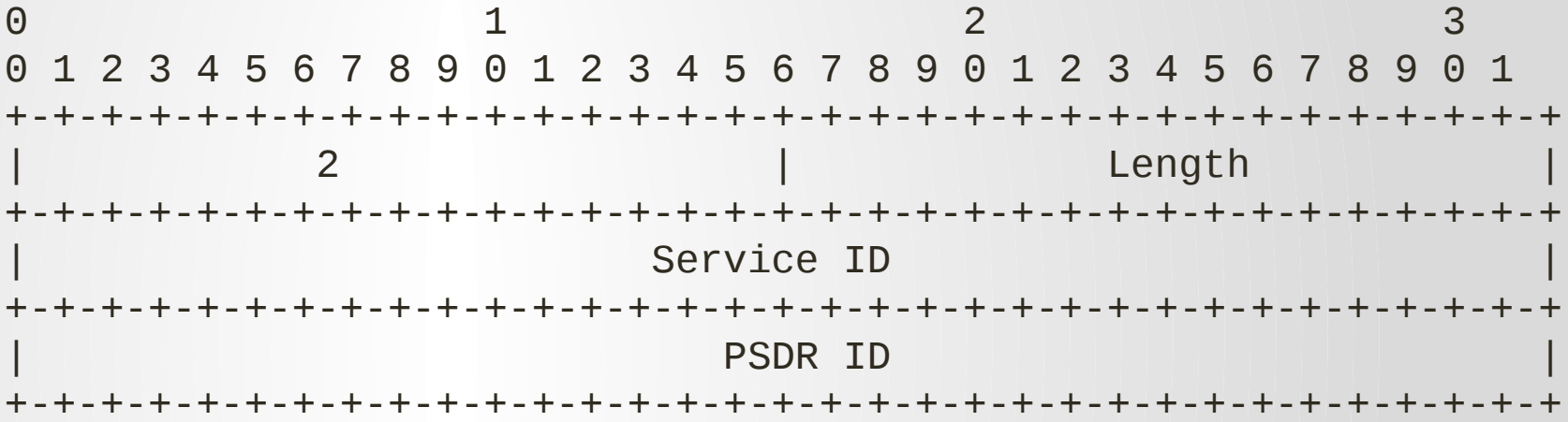
0: None defined - Ignore Service Metric

1 : Service metric overrides the IGP/SDR metric

2 : Computed metric is composite of IGP metric + SDR metric + Service metric

Service Distribution Router Discovery

Service Subscription Sub-TLV



PSDR ID: A 32-bit field that indicates the PSDR for data exchange. Set to 0 if there is no producer for the service.

Service Distribution Router Discovery

The Service ID registries has been defined

Range	Assignment Policy
0	Reserved (not to be assigned)
1-32767	Unassigned (Standards Action)
32768 – 65535	Experimentation (No assignements)
65536..	Reserved

Proposed Service ID assignments

Next Steps

- WG doc
- Feedback welcome

Questions ?