

## ✳️ What is an LSA?

**LSA** stands for **Link-State Advertisement**.

It's like a **message or update** that OSPF routers send to share **network information** with each other.

Each OSPF router sends LSAs to tell others:

“Hey, these are my connected networks and neighbors.”

All routers collect these LSAs to build the **Link-State Database (LSDB)**, which helps OSPF calculate the **best path** using the **Dijkstra algorithm**.

## 🧠 Different Types of LSAs

OSPF has **multiple types** of LSAs

### ✳️ Type 1 – Router LSA

- Generated by **every router**.
- Contains info about **all its directly connected networks and interfaces**.
- Flooded **within the same area only**.

#### 👉 Example:

Router says — “I’m Router1, and I’m connected to these networks and links.”

**Generated by:** All routers

**Scope:** Intra-area (within one area)

### ✳️ Type 2 – Network LSA

- Generated by the **DR (Designated Router)** on broadcast or NBMA networks.
- Lists **all routers connected** to that network segment.
- Flooded **within the same area**.

#### 👉 Example:

DR says — “I’m the main router on this LAN, and these routers are connected to me.”

**Generated by:** DR

**Scope:** Intra-area

### ✳️ Type 3 – Summary LSA

- Generated by **ABR (Area Border Router)**.
- Describes **networks in one area to other areas**.
- Helps OSPF share routes between areas.

#### 👉 Example:

ABR says — “Area 0, here are the networks you can reach in Area 1.”

**Generated by:** ABR

**Scope:** Inter-area

#### ✳️ Type 4 – ASBR Summary LSA

- Also generated by **ABR**.
- Used to tell **other areas** how to reach the **ASBR (Autonomous System Boundary Router)**.

#### 👉 Example:

ABR says — “Here’s how to reach the router that connects to external networks.”

**Generated by:** ABR

**Scope:** Inter-area

#### ✳️ Type 5 – External LSA

- Generated by **ASBR**.
- Used to advertise **external routes** (like routes from other routing protocols — RIP, EIGRP, etc.) into OSPF.
- Flooded **throughout the entire OSPF domain** (except stub areas).

#### 👉 Example:

ASBR says — “I’ve learned about network 8.8.8.0/24 from outside OSPF — here’s how to reach it.”

**Generated by:** ASBR

**Scope:** Entire OSPF domain (except stub areas)

#### ✳️ Type 7 – NSSA External LSA

- Used in **NSSA (Not-So-Stubby Areas)** instead of Type 5.
- Generated by **ASBR inside NSSA area**.
- Later converted into **Type 5** by the **ABR**.

#### 👉 Example:

ASBR in NSSA says — “I have an external route, but since this is an NSSA, I’ll send it as Type 7.”

**Generated by:** ASBR (in NSSA area)

**Scope:** Within NSSA area, then converted by ABR

#### 🧠 Summary Table

LSA Type	Name	Generated By	Purpose	Flooded To
1	Router LSA	Every Router	Info about router links	Within same area
2	Network LSA	DR	List of routers in the network	Within same area

<b>3</b>	Summary LSA	ABR	Advertises networks between areas	To other areas
<b>4</b>	ASBR Summary LSA	ABR	Info to reach ASBR	To other areas
<b>5</b>	External LSA	ASBR	Advertise external routes	All areas except stub
<b>7</b>	NSSA External LSA	ASBR in NSSA	External routes in NSSA area	Converted to Type 5 by ABR

### Simple Analogy (Easy to Remember)

Think of a **city (OSPF area)** with routers as **houses** 

- **Type 1:** Each house lists its rooms (interfaces).
- **Type 2:** Society leader (DR) lists all houses in the colony.
- **Type 3:** ABR tells other cities what's inside this city.
- **Type 4:** ABR tells other cities where the border gate (ASBR) is.
- **Type 5:** Border gate (ASBR) says "Here's info about the outside world."
- **Type 7:** Similar to Type 5, but for semi-closed areas (NSSA).